

PRACTICAL HELPS FOR FARM AND HOME

VOLUME III



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VOLUME III

(Wartime Edition)

A Collection of Practical
Time and Labor Saving
Ideas, Conservation Sug-
gestions, Useful Informa-
tion and Frequently-Used
Reference Data for Use on
the Farm and in the Home



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FARM MECHANICS SECTION

To Tighten Loose Wood Screws

Remove the loose screw and drive into the hole a wooden peg that fits firmly and yet not so tightly as to split the wood. Then replace the screw and it will hold. If the screw must withstand some stress, a bit of glue on the peg will hold it even more firmly.

Here's another way to tighten loose screws. Remove the loose screw, pack the hole with steel wool, then screw it back into place. It will be as tight as new.

To Release Tight Screws

Here is a simple but ingenious way to loosen a tight screw. Press a red hot poker against the head. This heats the screw which will expand and of course its hole will be enlarged too. When the screw cools it will contract but the hole will not. The screw is then loose enough to remove without undue effort.

How to Remove Broken Screw

If you unfortunately break off a screw in hard wood, don't despair. You can remove it neatly by drilling a small hole alongside of the broken section and in line with the grain of the wood. With a nail punch then carefully drive the screw into the drilled hole. You'll have little trouble lifting out the broken section after you have moved it over into the drilled hole. Plug the drilled hole with a peg of hard wood and you are ready to start all over with a new screw in the old hole.

Make Worn Bolt Threads Hold

If the threads of a bolt or nut become so worn that they will not hold satisfactorily, split the bolt with a hack saw and spread it slightly with a cold chisel. This will correct the condition so the equipment can be used until a new bolt and nut are obtained.

Grease Saw with Bacon Rind

If you have a saw that has a tendency to pinch, grease it lightly with a piece of bacon rind, and it will work much better.

True Hammer Face

If your hammer gives you trouble by glancing, it probably is because the face is worn round. Grind it true and flat on the grindstone, and you will find that nails will drive much easier, because the cause of glancing has been corrected.

Strengthen Axe at Hilt

Handles of axes that are used for splitting wood most often break where they enter the head of the axe. The break is usually the result of twisting in removing the axe from the block. You can add a great deal to the life of your axe handles by reinforcing them at this point. One way to reinforce is to drive an old three-cornered file into the opening of the underside of the handle. Break it off but leave about three or four inches exposed.

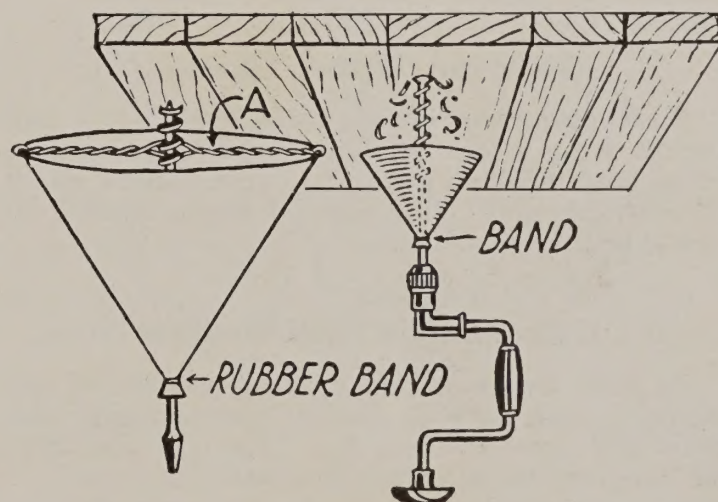
Protect Teeth of Handsaws

If you carry handsaws about the farm along with other tools, you probably have had trouble from damage to the teeth of the saw. An old piece of garden hose can remedy the trouble. The hose is cut the length of the saw and slit along one side. This fits smoothly over the saw teeth and gives needed protection.

Ice Cleans Grindstone

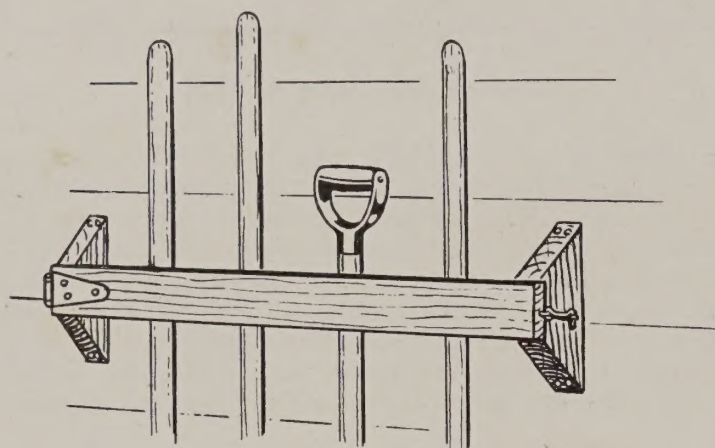
If your grindstone becomes badly coated with dirt and steel, hold a piece of ice against it while it is turned slowly. Remarkable as it seems, this will remove the accumulation very quickly.

To Catch Chips When Boring Overhead



This conical dirt catcher will keep chips, dirt and dust out of your face when you are boring holes in the ceiling. It is made of stiff card board and is provided with a wire guide at the wide end to hold the cone in position and is fastened with a rubber band around the shank of the bit. It, of course, revolves with the bit while boring. When you are working in the house, this device also keeps the litter off the floor.

Keep Tools from Underfoot



If shovels, spading forks, pitchforks and similar tools are stored where they may be knocked down and trampled on by livestock this simple rack may be all that is needed to remedy the trouble. Attach two short 2"x4" blocks to the wall where tools are customarily kept and at a height below the tops of handles. Hinge a 1"x4" board to one block and fasten the other end with a hook. It is not advisable to set the mounting blocks more than two feet apart. If more storage space is required increase the number of racks. This rack merely holds the handles against the wall so that the tools will not fall over and get tangled underfoot. A piece of 1"x2" may be nailed to the floor several inches out from the wall to keep the lower ends of the tools from sliding out.

Preserve Tool Handles

An occasional rub-down of tool handles with linseed oil will preserve them, as well as improve their utility and appearance. The oil is applied from a cloth dipped in linseed oil.

To Mend Copper Tubing

First clean the broken tube carefully; then tightly wrap break or split with copper wire. Using a hot soldering copper, run a coat of solder all over the wire. This type of repair makes the pipe almost as good as new.

Cementing in Cold Weather

In cold weather, one or two pounds of salt added to each sack of cement when mixing concrete will prevent freezing. This will also keep the concrete from drying too fast.

Wet Snow Won't Stick to Shovels

By coating shovels with melted paraffin, the annoyance of wet snow sticking to shovels can be overcome. This is really quite a labor-saver when one considers the extra effort necessary to knock snow off the shovel and the decreased capacity of the shovel if this is not done. Try it the next time you have wet snow to shovel.

Grease Boots with Bacon Rind

Leather boots and work shoes can be kept soft and pliable as well as reasonably waterproof by frequently rubbing them with the inside of bacon rind. Do not use this if boots are ever to be polished as they will not polish after such a treatment.

Device for Windmill Pump Control

This device will keep your water tank filled without attention—regulating the operation of your windmill according to the water level.

Operation is controlled by a balanced beam with a weight on one end and a float on the other. As the water level goes down the float drops too, acting as a weight to swing the beam downward. As water level rises the float is raised and allows the weight on the other end to swing the beam upward. Since the beam is attached to shut-off of windmill the swing of the beam governs the operation of the windmill.

The tank should be located close to the windmill base so the beam will not have to be too long to reach from the windmill out over the tank. Set a post close to the windmill, about one-third the distance to the tank. Over the post put a 4"x4" beam attached to the post by a hinge. The beam should be attached at a point about one-third its length with the larger end toward the tank. The beam is not attached at the center so that the comparatively light weight of the float will have enough leverage to operate the beam with the counterbalance weight at other end.

The wooden block float tied to one end with a length of cord should be heavy enough to act as a weight. The weight on the other end of beam (short end) should be sufficiently heavy to operate shut-off mechanism of mill and somewhat balance the beam. Adjust length of cord on float and the point of attaching beam to shut-off mechanism of mill to get desired range of operation. And there is your device ready to operate.

Magneto-Type Pump Engine Shut-Off

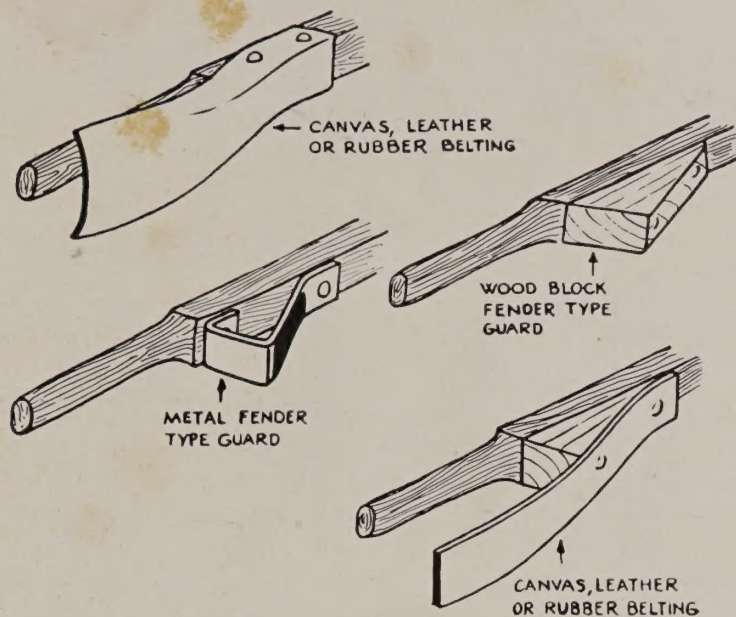
If you use a magneto-type gasoline engine to pump water, you can rig it so that the engine will shut off when the water has reached a predetermined level. Using almost any kind of insulated electric wire, splice one end into the magneto wire and scrape the insulation on the other end, too. Then arrange the bare loose end of the wire in the tank so that it comes down to the level you want the water to reach. Be sure it does not touch the side of the tank. When the water rises and touches the bare tip of the wire, it grounds out the magneto and stops the engine.

Horseshoes for Hooks

Horseshoes make husky hooks around the barns and sheds. They can be fastened overhead to the joists or to the sides of wall studdings with either nails or screws.

Knuckle Guards

For Trucks and Wheelbarrows



Many hands have been broken, fingers smashed and knuckles skinned as a result of striking the hands against door jambs, columns, piles of materials and other objects, while handling trucks and wheelbarrows. Knuckle guards that give fairly good protection are easily made. The accompanying illustration shows how.

National Safety Council Safety Instruction Card No. 248.

Paint Tug Links to Save Time

To equalize tugs with chain traces it is, of course, necessary to count the links. This is a nuisance. By painting a certain link on each length of chain the count can be made from the link so marked, which saves much time.

Grain Drill Seed Supply Made Visible

By sawing a small hole in the grain drill seed box and covering it with a piece of clear glass, you can see from your tractor seat whether or not the seed supply is exhausted. This saves frequent stops necessary to see that there is a supply of grain seed in the box.

Pump Cleans Seed Drill

A tire pump can be useful in cleaning the seed drill of dirt and seed. This is safer than any other method because the compressed air from the pump cannot damage the drill.

Prevent Crows Eating Newly-Planted Corn

A quart of kerosene poured over each bushel of corn will discourage the crows from digging up your newly-planted corn. This treatment does not hurt the seed corn.

Handy Twine Holder

To keep twine from tangling while tying corn shocks in the field put the ball of twine in an old pail. For a handy knife with which to cut the twine rivet an old binder or mowing machine section at the top of the pail so that it projects over the rim.

Binder Twine Holder

A temporary twine holder can be made by using a sack. Put the ball in a sack, tie the sack loosely, leaving the loose end of twine projecting. This will help prevent the twine from unwinding and becoming tangled.

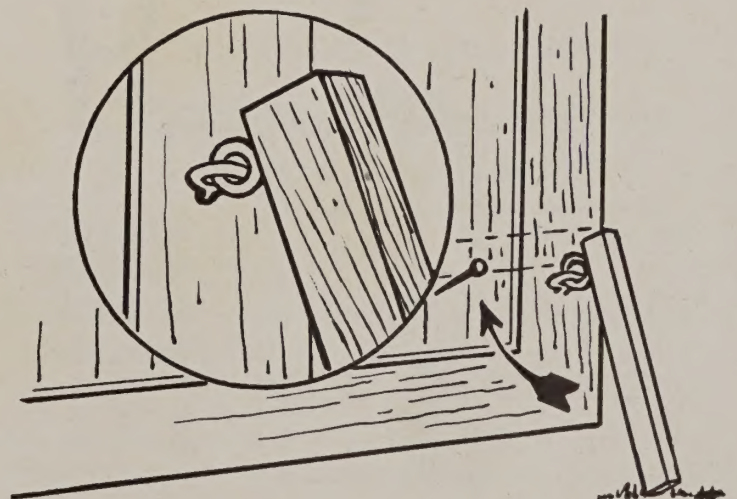
To Remove Road Tar Spots

Linseed oil will remove road tar without damaging the finish of your automobile. Saturate the spots of tar with the linseed oil. Let linseed oil stand for a few minutes to allow it to penetrate the tar. Heavier spots require more time. Then remove each spot with cheese cloth. The linseed oil softens the tar so that it can be easily rubbed off.

Wax Auto Door Latches

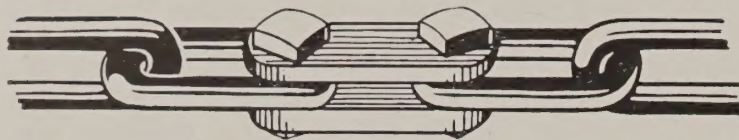
Auto door latches should never be oiled. The oil catches dirt and will soil clothing. Either paraffin wax or hard stick grease should be rubbed over the latch and strike plate. Latches will work smoothly and easily after this treatment. The same treatment may be applied to any door latch that is not operating as smoothly as it should.

To Hold Doors Open



Two 1"x1½" boards about 18 inches long will hold your garage doors open. Using screw eyes, attach one end of a board to the inside of each door. The boards should be hung low enough to drag on the ground a little. When the door is opened, the board drags on the ground and when the door attempts to swing shut, the board catches in the ground and jams the movement of the door in that direction. A nail is driven into the door at one side of the board so that the board can be swung over and rested on the nail, holding it out of the way when not needed.

Repair Link for Log Chain

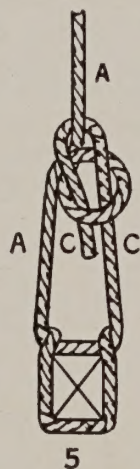
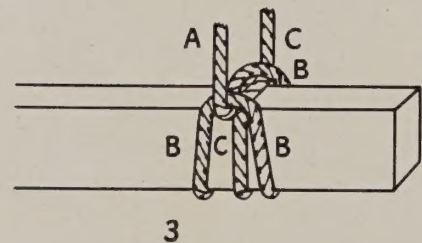
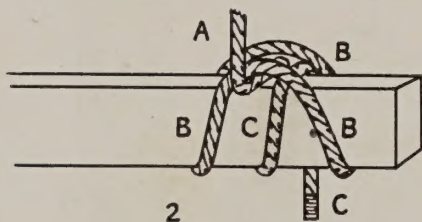
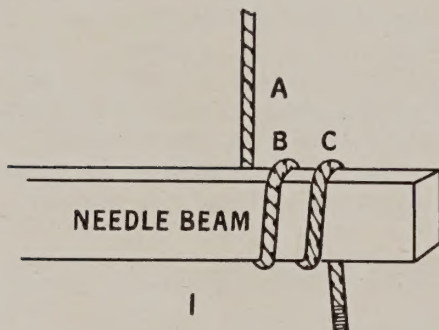


You can quickly make a temporary repair of a broken log chain or join two short chains of the same size. Cut two strips of heavy strap iron a little longer than one link. Bore holes at each end of the straps large enough to take short bolts the same diameter as the material which form the links of the chain. The bolts are drawn down tight enough to grip the chain. The bolt ends should be riveted to prevent the nuts from working loose.

Mousetrap Paper Clip

Do you find trouble keeping current account notes, receipts, delivery slips, and other papers of only current importance? Take an ordinary mouse trap, remove the trigger and screw the wood base to the wall at some convenient place. Papers can be clipped under the bar as they collect. This will hold them ready for the time they are needed.

Scaffold Hitch and Bowline Knot

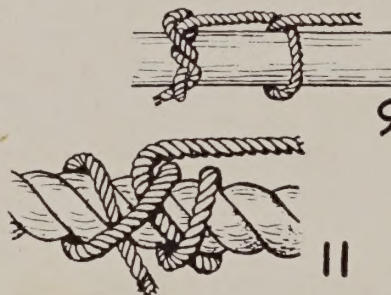
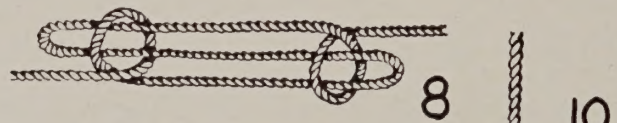
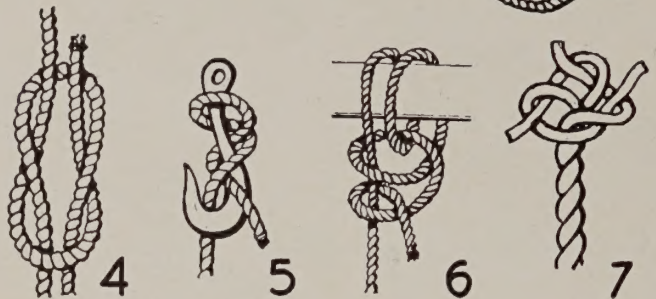
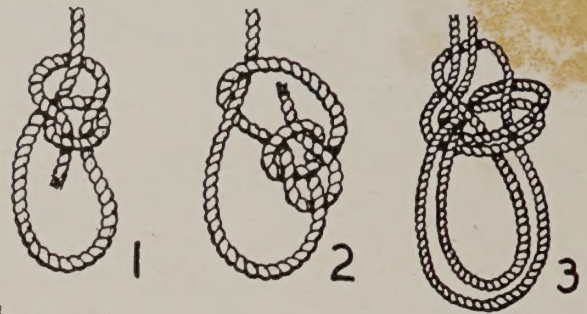


HERE IS THE
BOWLINE KNOT
AS USED IN
THIS CASE

The Scaffold Hitch is used to prevent the needle beams of suspended scaffolds from turning. The loose end of the rope is secured with a bowline knot.

1. Take two turns around the beam.
2. Bring end "A" forward between turns "B" and "C" then loop "B" over end of beam.
3. Pick up end "C" and adjust tautly, tying into "A" with Bowline.

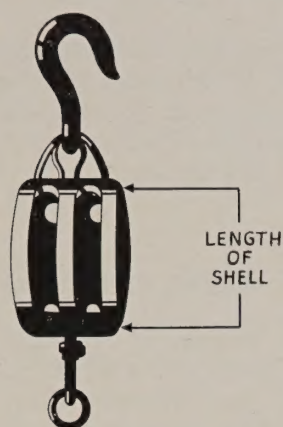
Dependable Rope Knots, Hitches and Slings



1. **Bowline**—Gives a loop that will not slip under strain, and can be easily untied when strain is released.
2. **Running Bowline**—Passing long end through loop makes good slip knot.
3. **Bowline on a Bight**—Makes comfortable emergency sling to sit in.
4. **Square or Reef Knot**—for joining ropes together.
5. **Double Blackwall Hitch**—for hitching rope to a hook for hoisting.
6. **Fisherman's Bend**—for fastening a rope to a ring or anchor.
7. **Wall Knot**—used to prevent unstranding and act as a stopper.
8. **Sheepshank**—for shortening a rope or to pass by a weak spot.
9. **Timber Hitch and Half Hitch**—for lifting spars. Can be easily loosened when strain is taken off, but will not slip under a pull.
10. **Clove Hitch**—for fastening staging to upright or securing loose ends.
11. **Rolling Hitch**—for hauling spar or large cable.

National Safety Council Safety Instruction Cards.

Rope and Block Sizes



The choice of proper size blocks for a rope of given size has a lot to do with safety and the life of rope. Sheaves that are too small produce unnecessary wear on the rope and increase the friction load.

The best practice is to use the largest blocks that can be used giving due consideration to ease in handling, etc.

Recommended block sizes are as follows:

Size of Rope Dia.	Size of Block Designated by length of shell in inches
$\frac{3}{8}$ "	3"
$\frac{1}{2}$ "	4"
$\frac{9}{16}$ "- $\frac{5}{8}$ "	5"
$\frac{3}{4}$ "	6"
$\frac{13}{16}$ "- $\frac{7}{8}$ "	7"
$\frac{7}{8}$ "-1"	8"
1"	9"
$1\frac{1}{8}$ "	10"
$1\frac{1}{4}$ "	12"
$1\frac{3}{8}$ "	14"
$1\frac{1}{2}$ "	15"
$1\frac{5}{8}$ "	16"

National Safety Council Safety Instruction Card No. 88.

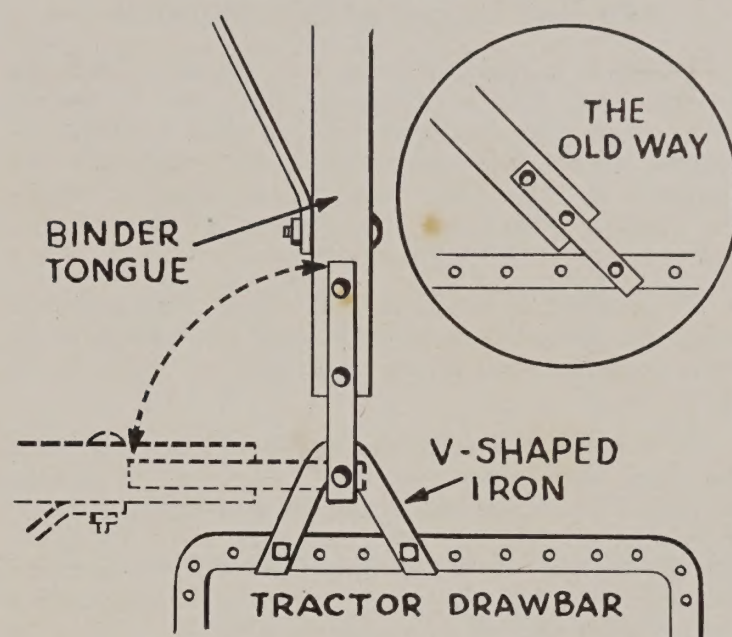
Oil Spreader Box

Two coats of used crankcase oil at the beginning of the season will effectively prevent manure from sticking and caking to the spreader box. Coat the oil on with an old paint brush, just like paint. After the first coat is well soaked in, apply a second coat.

Linseed Oil Preserves Wagon Wheels

Periodic soaking of wagon wheels in linseed oil will not only preserve and lengthen the life of the wheels but will keep the tires tight. This can be done by using a deep, narrow trough filled with linseed oil into which the wheel is set. If the wheel is not removed from the wagon the wagon can be slightly jacked-up so that the wheel will be free but immersed in the linseed oil. Turn the wheel every couple of hours until it is entirely soaked.

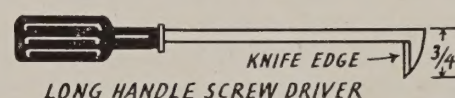
Hook-Up to Stop Split Binder Tongues Caused by Sharp Turns



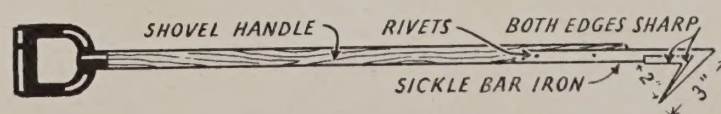
Sharp right angle turns may split the binder tongue on some tractor hook-ups. Note in the part of diagram labeled "old way" how tongue of binder may be split or broken by pinching against tractor draw bar if the angle of turn is too acute, such as a square turn made at corners.

The main diagram shows a simple 'V'-shaped attachment to the draw bar that permits a sharp right-angled turn and a neater job of cutting the field without danger of smashing the binder tongue. The attachment is made of iron a little lighter than that used in the drawbar, drilled for bolting to drawbar and attaching to binder tongue.

A Tool to Clean Spreader Beater



If you've had the mean and tedious job of cleaning the straw, hay and binder twine from the beater of a manure spreader here is a hand tool that will do it in a jiffy. It will end skinned hands and broken knife blades. Your blacksmith can make it for you out of an old long-handled screw driver. A hook is formed at the end of the screw driver and the inside of the hook is sharpened to a knife edge. With this tool you can hook in around the beater, cutting and pulling out clogging material.



A similar tool on a larger scale can be made for removing large weeds from the hills of corn. Use an old shovel handle and rivet a sickle bar iron onto the end of the handle. In this case both inside edges of the hook are sharpened.

Belting Selection Information

To Find Length of Belt Required

When it is not convenient to measure with the tapeline, the length required, apply the following rule: Add the diameter of the two pulleys together, divide the result by 2, and multiply the quotient by $3\frac{1}{4}$; then add this product to twice the distance between the centers of the shafts, and you have the length required.

If possible to avoid it, connected shafts should never be placed one directly over the other, as in such case, the belt must be kept very tight to do the work.

It is desirable that the angle of the belt with the floor should not exceed 45 degrees. It is also desirable to locate the shafting and machinery so that belts should run off from each shaft in opposite directions, as this arrangement will relieve the bearings from the friction that would result when the belts all pull one way on the shaft.

To Find Belt Speed in Feet per Minute

Multiply diameter of pulley in inches by 3.1416. This gives circumference of pulley, and this result multiplied by number of revolutions will give you belt speed in inches.

Relative Transmission of Horse Power for any Given Width of Belt

The horse power for a given speed will be directly proportioned to the width of the belt; that is, a 4-ply belt, 16 inches wide, running at a certain speed, will transmit eight times as much power as a 4-ply belt 2 inches wide, running at the same speed, and a belt 100 inches wide, ten times as much as a 10-inch belt of the same thickness, running at the same speed, etc.

To Find Horse Power any Given Belt Will Economically Transmit

Multiply the width of the belt in inches by its speed in feet and divide the result by 800. The final result will be the horse power for a 4-ply belt. For a 6-ply belt, divide this result by 600; for 8-ply, divide this result by 400; for 10-ply, divide this result by 350.

To Find Ply of a Belt of a Given Width Required

To economically transmit a given horse power at a given belt speed, multiply the given horse power by 800 and the given width in inches by the given belt speed in feet, and divide the first result by the second.

If the final result is one, or nearly one, a 4-ply belt is required; if one and one-half, a 6-ply belt is required; if one and three-quarters to two, an 8-ply belt is required; if two to two and one-quarter, a 10-ply belt is required.

To Find Width of Belt Required

To find the width of a 4-ply belt required economically to transmit a given horse power at a given belt speed per minute: Multiply the given horse power by 800, and divide the result by the given belt speed.

To find the width of a 6-ply belt required: Multiply the horse power by 600; divide the result by belt speed.

To find the width of an 8-ply belt required: Multiply horse power by 400; divide result by belt speed.

To find the width of a 10-ply belt required: Multiply horse power by 350; divide result by belt speed.

To Find Speed and Diameter of Pulleys

The product of the diameter and speed of the driving pulley equals the product of the diameter and speed of the driven pulley; consequently, if the speed and the diameter of the driving pulley are given, multiply them together and divide by the diameter of the driven pulley to find the speed of the driven; or divide by the speed of the driven pulley to find its diameter.

Example—The drive pulley on a tractor is $9\frac{1}{2}$ inches in diameter and runs at 1,000 R. P. M.; what size pulley must be used on a thresher cylinder shaft that must run at 1,100 R. P. M.?

$9\frac{1}{2}$ times 1,000 equals 9,500; divided by 1,100, equals 8.64. Since pulleys are made only in certain standard diameters, use either the next size larger, 9-inch diameter, and raise the engine speed slightly, or use $8\frac{1}{2}$ -inch pulley, considering that the slight slippage will reduce the effective speed to the correct number of revolutions per minute.

Standard Sizes of Endless Canvas Belts

(Adopted Oct. 1, 1926.)

5"	4 ply	50 ft.	75 ft.	100 ft.		
6"	4 ply	50 ft.	75 ft.	100 ft.	125 ft.	
7"	4 ply	50 ft.	75 ft.	100 ft.	125 ft.	150 ft.
8"	4 ply	50 ft.	75 ft.	100 ft.	125 ft.	150 ft.
9"	4 ply					150 ft.
7"	5 ply				125 ft.	150 ft.
8"	5 ply				125 ft.	150 ft. 160 ft.
9"	5 ply					150 ft. 160 ft.
8"	6 ply					150 ft. 160 ft.
9"	6 ply					150 ft. 160 ft.

S. A. E. Standard Belt Widths for Farm Machinery

Belt Width	Number of Plies	Approx. H.P. Rating	Belt Length
5	4	18	75
6	4	22	50-75-100
7	4	26	100-125
8	4	30	125-150
8	5	37	125-150
9	5	42	160

The above table applies to the use of rubber or canvas stitched belting, having a velocity of 3,000 F. P. M.

Belt speeds of 2,600, 3,000 and 3,500 ft. per min. are S.A.E. Standard for all tractors. In designing new equipment it is suggested that the 3,000 ft. per minute belt-speed be used.

Driving pulleys for new equipment should be not less than 12 in. diameter and they should be not less than $\frac{1}{2}$ in. wider than the belt required.

Driven pulley diameters should be not less than 7 in. for 4-ply and 10 in. for 5-ply belts and should be preferably as large as practical conditions permit.

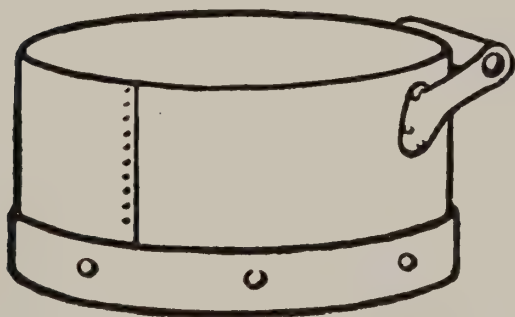
It will contribute to the operating condition to use pulleys of as large diameter as practical to secure the accepted velocity of 3,000 F.P.M.

It is desirable and a good practice to favor width instead of thickness, with this one exception, viz:

4-ply belts should not be used wider than 12 inches.

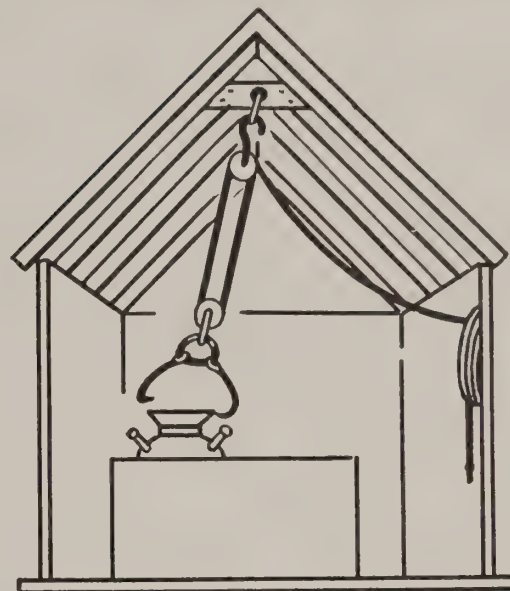
(For suggestions for the conservation of belting, see page 21.)

Milk Can Makes Feed Box



By cutting the bottom from an old milk can and riveting one of the handles to the side, a very handy feed box can be made. Care should be taken to finish and smooth off cut edge. If it is desirable a measured quantity of feed can be placed in can before cutting, and the level marked so that the feeder may be cut at that point. This makes the feeder a feed measure, too.

Hoist for Milk House



A block and tackle, more or less permanently suspended from the top of the milk house, can save many backaches from lifting heavy milk cans in and out of the cooling tank.

There are many satisfactory arrangements, one of which is sketched here. Exactly how you build yours will depend on material available about the farm and the construction and arrangement of your milk house. The general idea is to provide hooks which can be easily attached to handles of the milk can, so that it can be safely hoisted and swung from the tank. In most cases satisfactory scrap material for this purpose can be found around the farm.

The cost of such an installation is small and it may be the means of saving many times its cost in personal comfort and even doctor bills.

To Open Chain Stitched Bag

Here is a suggestion for both kitchen and barn. Usable sacking material comes to both. To save cutting the bag it is desirable to unravel the chain stitching. This is easy if started right. Remember to place the sack at right angles to you with the single stitching at your left, then begin unraveling the end nearest you. You'll find many uses for bags and sacking material if undamaged. The little extra care in opening the sacks is well worth the trouble.

Today, with supplies of material used for making bags cut off by the war, it is even more important that bags be saved for reuse.

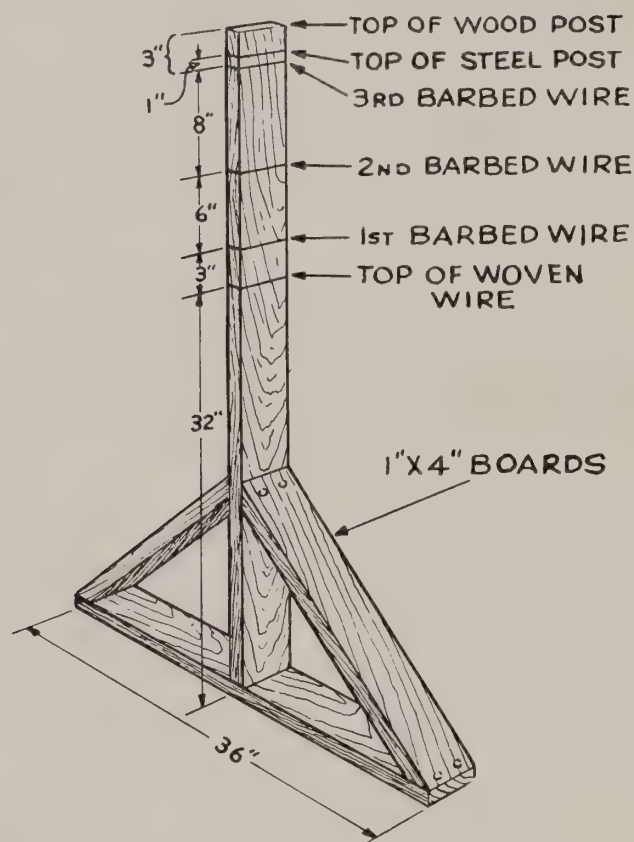
Toe Pull Opens Screen Door

Did you ever have to yell for help when you had your arms full and a screen door blocked your path? A toe pull attached to the bottom of the screen door is a great convenience in such circumstances. This may be a simple little block of wood securely nailed to the outside of the screen door and under which the toe of the shoe may be hooked.

FENCING SECTION

For complete information on fence building, refer to the 16-page book, "How to Erect Farm Fence", published by Republic Steel Corporation.

Marker Saves Time When Building Fences



You can save a lot of time when erecting fences by using the simple post marker shown above. It is easily constructed of 1"x4" boards and the spacing can be indicated by notches or, if the upright is painted a light color, by black lines. If the latter system is used, each corner can be marked, making the device useful for erecting four different styles of fence. Reference to a good fence erection manual will show how it should be marked for sizes other than that illustrated. When using the marker, just place it alongside the post and mark the post at the points indicated on the marker.

Staples Drive Easier

To drive staples more easily into hard wood, pour a little oil over them. They will not only drive easier, but will bend over less frequently, and the oil provides added protection against rusting.

Good Staple Puller

An old worn-out mowing machine guard will make a good staple puller. Drive the point of the guard through the staple between the wire and the post.

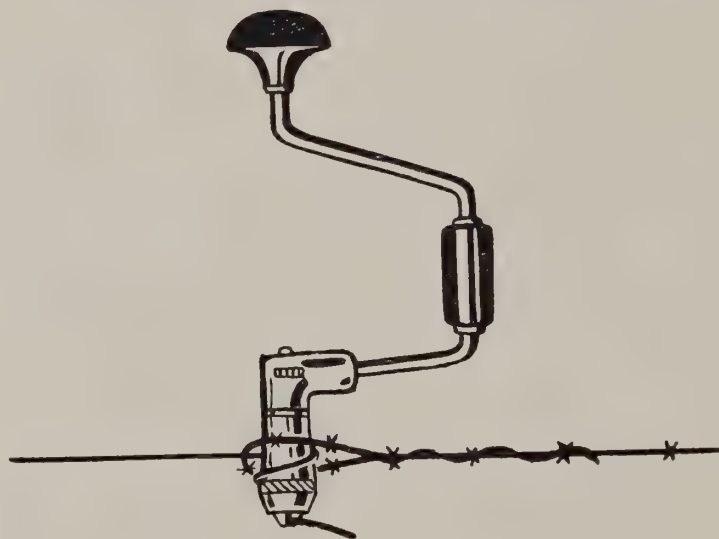
Regular Fence Inspection Urged

Due to the difficulty of getting materials and the shortage of farm labor, fences should be inspected regularly and repaired promptly during the present war emergency. Carefully check all posts, particularly end and corner posts, replace broken or loose staples or fasteners, mend broken wires and straighten fences which have begun to sag.

Protecting Fence and Barbed Wire in Storage

Here is a good plan to forestall rusting and add to the life of temporary fences and barbed wire in storage. Spray them well with oil every two or three months while they are being stored. A large hand insect spray can be used for the purpose and a medium grade motor oil should be employed.

To Mend and Restretch Broken Wire



You can make your broken wire tight as new by adding a piece of smooth wire as a connecting link between the two broken ends. Here's how to do it.

Splice a piece of smooth wire securely to one end of the broken wire and make a stout loop in the other end of the broken wire. Slip the loop over the chuck of an ordinary brace, then pass the linking wire through the loop, around the chuck of the brace and lock it in the jaw of the chuck. When the brace is revolved the linking wire will be drawn through the loop and wound onto the chuck. When the wire is tight enough, unwind the brace, being careful not to lose tension on the wire. The fact that the linking wire is drawn through the loop makes it easy to fasten without losing tension.

Double Span End and Corner Post Assemblies



Failure of this single span corner post, despite its large size, indicates that it was not securely anchored.

The effectiveness of the conventional method of building end and corner assemblies has been well demonstrated for many years. If properly constructed, one need have little concern over the ability of the construction to continue in good condition for a long time. Observations show, however, that many farmers either do not appreciate the necessity for proper anchorage or are unwilling to go to the trouble necessary to assure it. The result is poor construction, loosened fence and high maintenance. Even though the farmer were willing to go to the trouble necessary, it would still seem desirable to attempt to discover methods by means of which the results could be more easily attained.

Recent research at the Iowa Agricultural Experiment Station has been directed toward the development of end and corner assemblies, equally or more effective and capable of being placed with less work. It was believed that discovery of such a method would result in more effective fence performance on the farm. Field studies disclosed a large number of construction types in more or less common use. All of these, together with a number of ideas developed by the experimenters, were constructed and pulled to destruction. Their relative effectiveness and characters of failure were carefully noted. A second series of tests, modified after the first experience, was carried to completion. It developed that some ingenious farmers had discovered an effective answer.

The principal difficulty in building a fence end or corner arises from the fact that the force applied by the fence is some distance above the surface of the ground, while the resistance provided by the soil lies below the ground. This results in a couple or, more simply stated, a tendency to rotate, pulling the corner or end post from the ground. Various means have been employed to hold the post down. Anchored posts or anchor wires attached to "dead men" have been the most approved methods. Various expedients such as

anchors to solid objects, including stumps, or hanging large boulders, have been resorted to. These are unsightly, temporary in effectiveness and of doubtful value in saving of time.

Lengthening the span of an assembly definitely reduces the tendency toward the post lifting from the ground and, consequently, makes the assembly more effective. Practical limits are soon reached, however, and one has trouble in getting compression braces adequate to carry the thrust. It was discovered that if the bracing system were extended to the third post from the end, the tendency to rise from the ground was largely eliminated. This procedure adds but little to the cost as the additional material and labor are limited to a compression brace of wood or steel and a wire tension brace. The third post is necessary in the line whether used in the bracing system or not. It is also possible to reduce the size of the posts sufficiently to more than offset the additional cost for bracing.

To compare the performance of two types of assemblies over a period of time, a single span assembly and a double span were set 30 rods apart. An anchor post was set midway between the two ends to furnish a place to insert a dynamometer, as well as a fixed end, so that the individual characteristics of the constructions could be studied. The fence was composed of 832-6-11 woven wire with four strands of barbed wire above. Line posts were spaced a rod apart. The single span end consisted of a 9-foot span with a 6-inch end post and a 5-inch brace post. The double span end consisted of an 8-foot, 9-inch span and an 8-foot span. The end post was 4 inches in diameter and the other two were 3 inches. No supplementary anchors were used in either assembly.

All end and brace posts were set 3 feet, 6 inches in the ground. The woven wire was stretched until the tension curves were half removed and 250-pound tension was placed on each strand of barbed wire. A dynamometer in the line indicated a total tension of 2900 pounds. After five months, the horizontal movement of the single span assembly was nearly 30% greater than that of the double



The most effective type of double span assembly tested. Even this type may yield to the pull of the fence unless the wire braces are sufficiently strong and carefully stretched.



The steel braces used here are easily fastened in place and prove very effective.

span and the vertical movement was 19 times as much. The single span required more material for construction than the double span.

The double span shows even greater superiority when used in corner construction. The reason for this is found in a study of the type of failure in each case. The single span end fails by rising out of the ground. The double span end is pulled through the ground and may tend to buckle because the fence really pushes on it instead of pulling. When the single span is used in a corner, the load on each fence must be reduced because the resultant of the two tends to pull the corner post from the ground on the bisector of the angle formed by the two fence lines.

Not so with the double span assembly. One fence line tends to prevent movement of the other in a lateral direction, with the result that both assemblies are stabilized. With devices available, it was not possible to pull the double span corners to destruction. It was apparent, however, that it was possible to load each fence comprising the corner as heavily as was possible when the assembly was tested as an end. The double span corners held more than 200 per cent of the load of any single span corner with only 50 per cent or less of the horizontal movement.

The posts used in the time test mentioned above are somewhat small. The purpose was to find the minimum for satisfactory performance.



One farmer's conception of a double span assembly.



An effective double span corner assembly in a well-constructed fence.

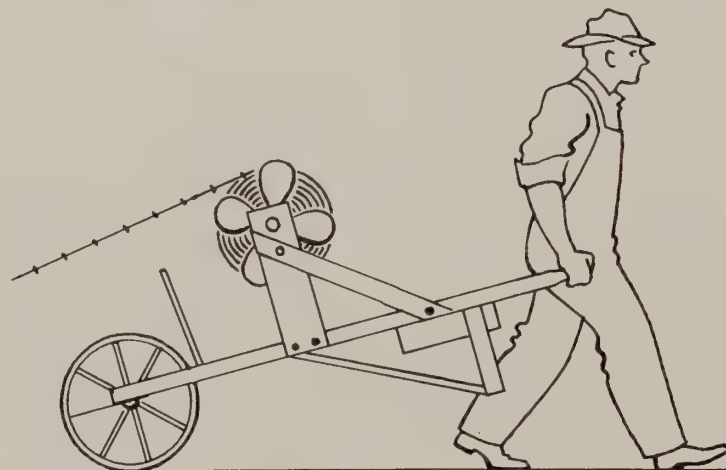
The following sizes are recommended. The lengths of span are optional but, if the posts are so spaced that an 8-foot compression brace can be used, the total will be approximately one rod, which makes for easy spacing and also helps simplify calculating field acreages if the line posts are also spaced one rod apart.

End Post	5-inch diam.	8 feet long
Brace Posts	4-inch diam.	8 feet long
Compression Braces (Wood)	4-inch diam.	8 feet long
Compression Braces (Steel)	2-inch O. D.	8 feet long
Tension members—Two double strands of No. 9 wire.		

If the wood posts are not treated for decay-resistance, they should be larger to allow for deterioration.

Reprinted from "The Farm Fence Handbook" by Prof. Henry Giese, Revised April, 1942.

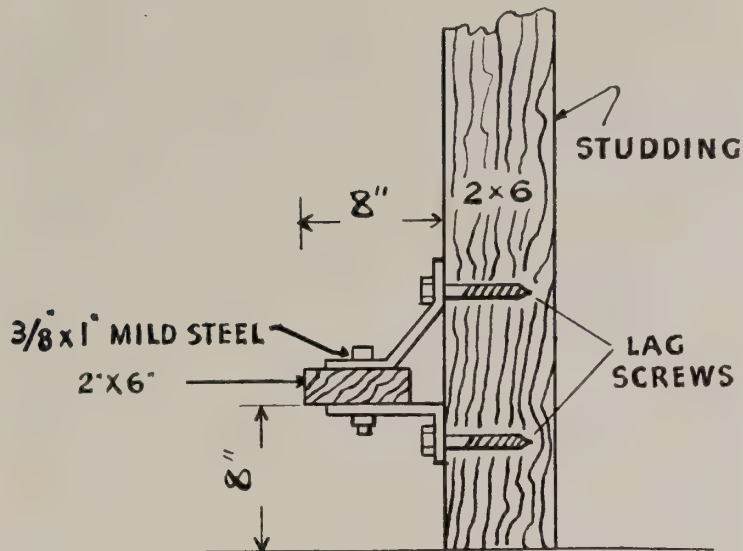
One-Man Barbed Wire Unreeler



If you have an old wheelbarrow on hand, it's a simple matter to make a barbed wire unreeler that can be handled easily by one man. Place two uprights each about a foot high, near the front of the wheelbarrow, bracing them toward the handle. Holes through the uprights will carry a shaft on which the reel of barbed wire will turn. By pulling the wheelbarrow, the barbed wire will pay out automatically. A box nailed to the inside of one of the two wheelbarrow handles can serve to hold tools, staples, etc., if desired. A lid on the box may keep these from bouncing out.

LIVESTOCK SECTION

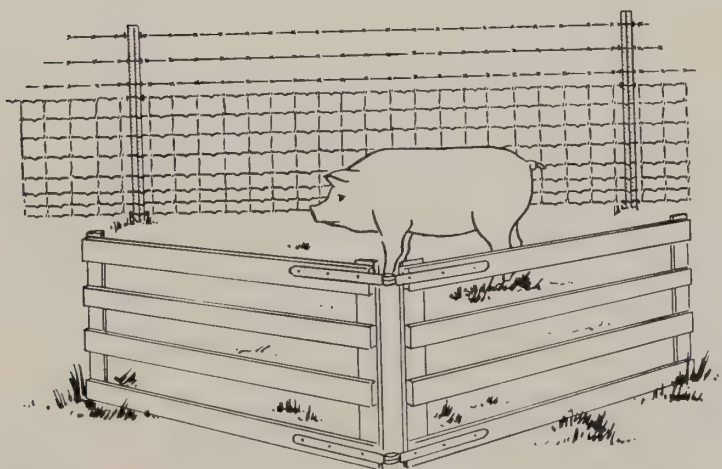
Pig Fender Saves Little Pigs



With the government calling for more and more hogs under the Food-for-Freedom program and with prevailing pork prices, it is both patriotic and profitable to raise more pork. While it may not be possible to farrow more sows, it is more important than ever to raise all the pigs to marketing weights.

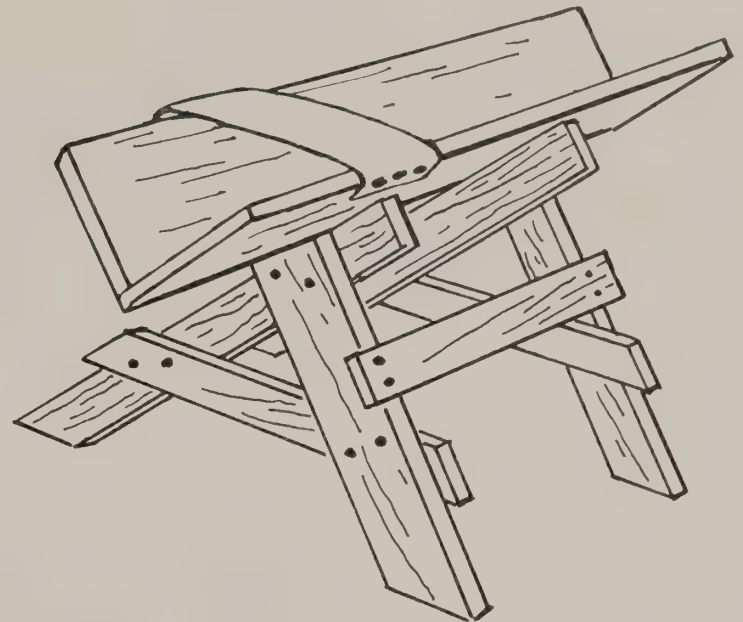
The pig fender or guard illustrated above is one good way of preventing loss of small pigs through crushing against the wall when the sow lies down. It can easily be made of materials which are readily available and should be placed on each side of the farrowing pen.

Gate-Type Hog Catcher



Two simply constructed gates hinged together can be used to catch a hog in the lot without the necessity of driving him into a corner. The hog can be approached and trapped at any point along the fence.

Holder for Vaccinating Pigs



The right equipment makes any job easier. If you have a large number of shoats to vaccinate, it is well worth the trouble to make up a holder to hold the pigs during the operation. It is easily made.

Make a trough about three or four feet long of good husky ten-inch boards. For legs use four pieces 2" x 4", securely fastened to the side of trough in an X form. Legs can be any length that will bring the trough to a convenient height for the veterinarian to work on the pigs. Cross-brace the X of the legs on each end. The thickness of the cross-brace should be considered when attaching the legs since the cross-brace will be nailed in one direction on one leg, and in the other direction on the other leg.

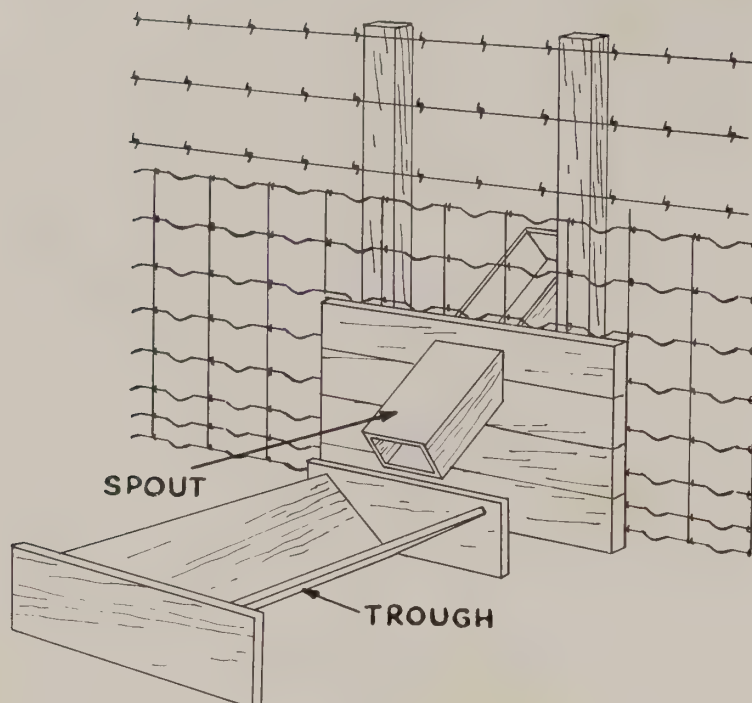
Therefore, the legs should be separated by the thickness of the material used on the cross-brace. This is so the brace will nail up flush with each leg. A good stout side rail should be nailed on each side, attaching the two sets of X-legs.

Across the trough, about one or two inches from one end, a strong piece of binder canvas, about three or four inches wide, should be securely fastened, leaving plenty of room for the pig's head under the canvas. The space from the end of the trough to the edge of the canvas provides for a breathing space for the pig.

When the pigs are lifted into the trough on their backs, they are slid endwise so their heads slip under the canvas. The trough firmly holds the pig during vaccination.

In making this trough, be sure to make it sturdy and strong, so that there will be no danger of collapse.

Easy Pig Feeder



This pig feeder saves steps and avoids the trouble of fighting with the hogs to keep them from knocking over the buckets of milk and feed. The spout is set to pass through the fence at a steep angle and so it empties directly over the feeding trough. At feeding time you merely have to pour the feed into the spout from the outside of the pen. Be sure the spout is well braced.

It will probably be necessary to cut some of the wires of the fence to permit the spout to pass through. Be sure these wires are stapled to the posts on either side and staple the loose ends to the two-inch pieces which hold the spout.

Handling Stubborn Hog

A stubborn hog can be successfully loaded into a truck by placing a bushel basket over his head. The hog will back away, trying to get out of the basket, and can be backed wherever he should go.

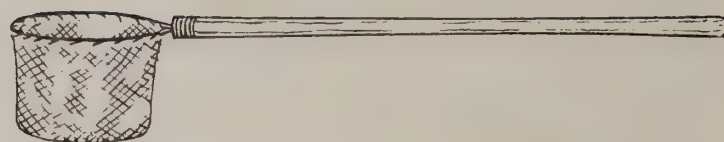
Keep Self-Feeder from Clogging

To keep the self-feeder from clogging, old chains can be fastened from the inside. As the hogs eat, they move the chains about, preventing clogging of the feed.

To Stop Strange Hogs from Fighting

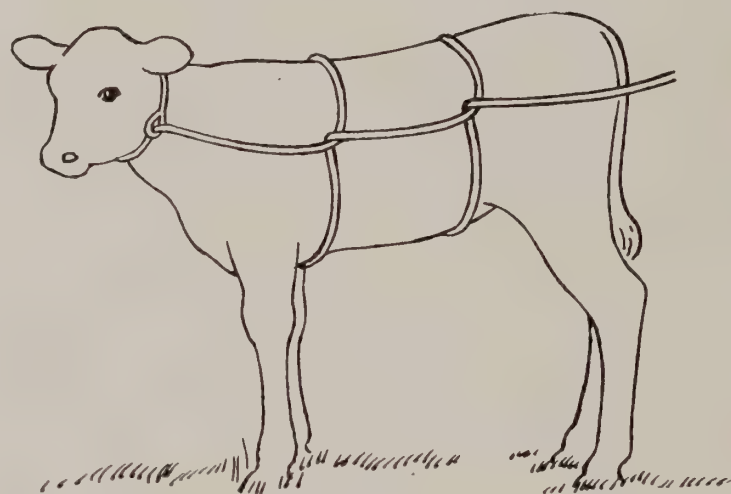
When you must turn a strange group of hogs in with your regular group first smear used oil on both groups. An old paint brush can be used for this purpose. The oil destroys the odors by which one group of hogs would be able to detect the other group and thus gives them no cause to fight with each other.

Pig Catcher



With this easily-made device you can take a pig away from the crossest sow in perfect safety. Take a piece of heavy wire about $4\frac{1}{2}$ feet long. Shape it as though making a frame for a fishing dip net. Drive the shanks into a strong light handle about 6 feet long. Take the bottom half of a gunny sack and sew the open end around the hook with stout cord. With this device you can lean across the fence and scoop up the small pigs. The correct procedure is to put the sack down over the pig and give a quick jerk which will throw him off his feet and land him in the sack. The pig will lie quietly in the sack until you take hold of him.

Rope Trick Throws Cattle



To throw a calf or bull, put a rope around the neck, and a half-hitch around the flanks as shown in illustration. Pull on the rope and the animal will come down easily.

Stop Cows Splashing Water

If you have trouble with your cows lapping drinking water and splashing it into feed and bedding, you can correct the situation. Put an ordinary screen wire horse muzzle into the drinking cup. The upper rim of the muzzle should be caught up under the inner edge of the drinking cup.

Breaking Sucking Cows

Some cows can be successfully broken of the habit of sucking themselves with the impediment of a horse collar around the neck. Try the treatment for a period; then remove the collar. If the cow attempts to return to her old habits, replace the collar. Repeat until cure is effected or cow indicates a hopeless case.

To Stop Cows from Tossing Hay

A No. 9 wire stretched by a coil spring across the top of a manger will effectively stop cows from tossing hay from the manger.

Erect a 2"x4" vertically and solidly at each end of manger so that the center comes about five inches back of the inner top edge of the manger and the top extends about ten inches above the top of the manger. Insert an eyebolt about three inches from the top of each 2"x4". The coil spring is attached to one of the eyebolts and the wire stretched taut between the spring and the other eyebolt. The spring keeps the wire taut but allows it to give if bumped or hooked by a cow. Slack can be taken up by tightening the eyebolts. The wire interferes when the cow attempts to toss the hay.

Stop Horse Chasing Livestock

If you have a horse that seems to enjoy the sport of chasing other livestock in the pasture try this one. Fasten a short chain or plow clevis to the horse's front leg behind the knee. This should effectively discourage the chasing habit.

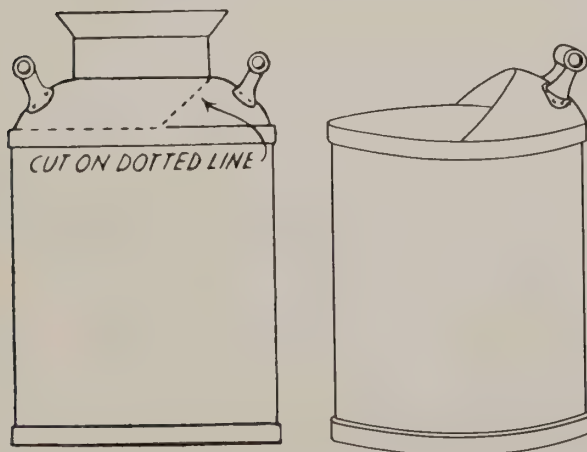
Stops Chewing on Mangers

To stop horses from chewing the upper edge of wooden mangers, staple smooth wires, one on the top inside edge and another on the top outside edge. This will effectively discourage the chewing habit.

Controlling Greedy Horses

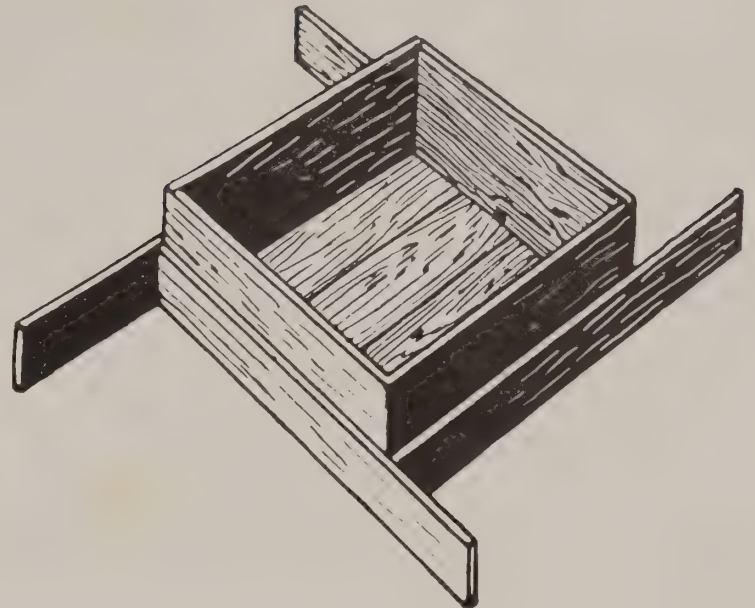
A large smooth stone in the middle of the feed box will effectively slow down horses that eat too rapidly or throw their feed out of the box.

Use for Old Milk Cans



Don't throw away your old milk cans. With slight alterations they can be made into handy containers for carrying feed and for other uses about the farm. Trim them as shown in sketch. After cutting off tops be sure edges are bent in so as not to be dangerous. One of the advantages of these containers are that they are easy to clean.

Stock Salt Box



You can't always be assured of a clean supply of salt handy to your stock at all times if the salt box is usually upside down in the barnyard. An ordinary box invariably is overturned by stock in getting at the salt block.

However, you can overcome this difficulty by nailing four boards around the outside of the box, arranging them so that one end of each board is flush with a corner of the box, and the other end projects eight or ten inches. Nail a board in this manner to each side of the box, progressing around the box so the projection of each board is always to the right. This arrangement makes a broad base for the box which, in most cases, is sufficient to keep it from being upset.

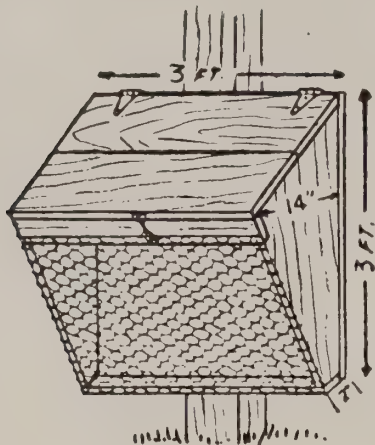
If this is still insufficient, take four pieces of 2"x6" four feet long and nail them together in the same way as the sides were added to the box above, leaving about a one-foot square in the center. Put a bottom in the center square for the salt, and you have a heavy, well-supported salt box that rarely, if ever, will be overturned by stock. In most cases, the first suggestion is effective enough.

Carrying Straw in a Breeze

With this easily made device, you can carry straw to distant hog houses even on a windy day. It is made somewhat like a wagon sling. Take three boards about one inch square and about thirty inches long. With four pieces of light rope or heavy cord, tie the boards about sixteen inches apart, so that when the sling is laid out flat the boards lie parallel, in one direction, and the ropes in another. Each rope will, of course, be tied to each board, and the ropes will be equally spaced across the thirty-inch length of the boards. Straw is loaded onto the sling, laid out flat. The sling is then doubled over for carrying. The four ropes can be knotted together at each end of the sling at a convenient distance from the end boards. This makes the loaded sling easier to carry or drag.

POULTRY SECTION

Green Feed Rack for Poultry



To save waste of alfalfa and other green poultry feed, use a feeding rack attached about four inches above floor. The sides and back can be of wood with a hinged cover at top. Cover the front with half-inch mesh chicken wire. For dimensions and construction detail see illustration.

Chicken Life Raft

If you have an open water tank in the barnyard in which your chickens insist on getting drowned toss in a small board float. The chickens will save themselves by getting aboard the float and navigating to safety.

Control Measures for Coccidiosis

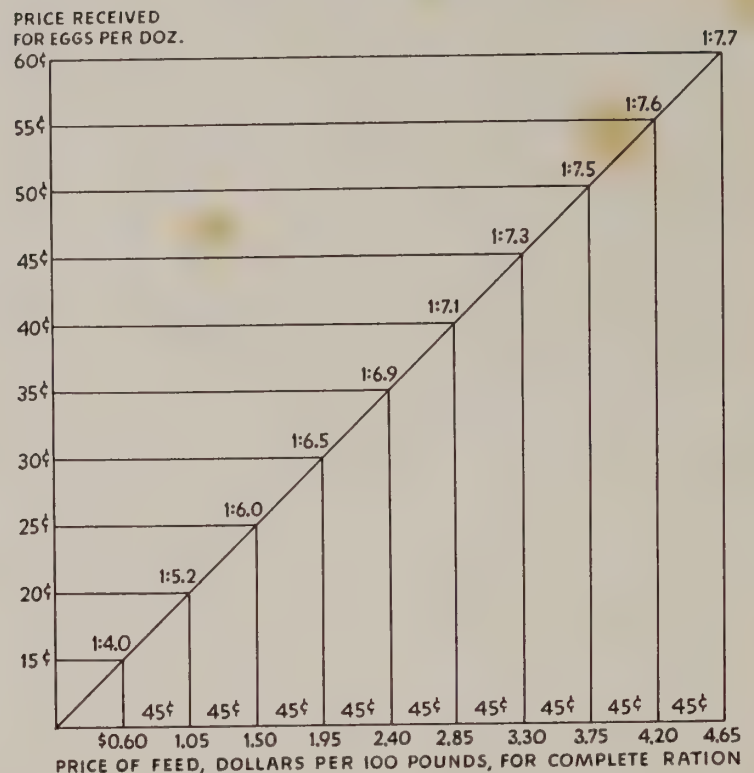
1. Keep the chicks confined to the brooder house and sanitary sun porch.
2. Change the litter each day for a period of 10 days.
3. Burn the litter removed or spread it on land not used for poultry range.
4. Scrub the fountains each day and put reels on the feeders that do not have them.
5. At the end of the 10-day period scrub the brooder house with scalding lye water using 4 oz. of lye to 10 gallons of water.
6. If the chicks cannot be provided with a sanitary sun porch with a floor of deep coarse gravel, concrete, wood slats or wire cloth, the brooder house should be moved to clean range.

Iowa Agricultural Extension Service Bulletin P47.

To Find Amount of Disinfectant Required for Poultry House

To determine the number of gallons of disinfectant necessary for disinfecting a poultry house, multiply the length of the poultry house by the width, in feet, and divide the result by 20.

Egg Profit Calculator



The chart above is designed to permit calculation of the feed-egg ratio (number of dozens of eggs which must be sold to buy 100 pounds of feed) necessary to assure a net profit of \$1.00 a year per bird.

Horizontal lines represent prices per dozen received for eggs as indicated to the left of the chart and vertical lines represent feed price per 100 pounds for complete ration as indicated at bottom of chart. Figures on diagonal line at junction of horizontal and vertical lines indicate feed-egg ratio (1 representing 100 pounds of feed and the right hand figure of the ratio representing the number of dozens of eggs which must be produced per 100 pounds of ration fed) to insure a net profit of \$1.00 per bird per year.

Example: If the poultryman is paying \$3.30 per hundred pounds for complete-ration feed and receiving 45¢ a dozen for his eggs, it is necessary for him to secure 7.3 dozen eggs per 100 pounds of ration fed to insure a net profit of \$1.00 per hen at the end of the year.

Takes Fight Out of Roosters

A piece of strong cord with an anti-slip loop at each end is all that is necessary to dampen the ardor of a quarrelsome rooster. One loop is tied around the rooster's neck; the other is left dangling. When he tries to fight, he gets his feet tangled in the dangling loop, and soon gives up fighting in disgust. The bowline knot, or its variations, will be found satisfactory for the purpose of making the loops.

FARM BUILDING SECTION

For complete information on steel roofing and siding, refer to the 28-page book, "How to Select and Apply Steel Roofing on Farm Buildings", published by Republic Steel Corporation.

For information on the conservation of steel roofing and siding, refer to the 28-page book, "Wartime Conservation Suggestions for the Farm Front", also published by Republic Steel Corporation.

To Find the Amount of Paint Required For a Given Surface

It is impossible to give a rule that will apply in all cases, as the amount varies with the kind and thickness of the paint, the kind of wood or other material to which it is applied, the age of the surface, etc. The following is an approximate rule: Divide the number of square feet of surface by 200. The result will be the number of gallons of liquid paint required to give two coats; or divide by 18 and the result will be the number of pounds of pure ground white lead required to give three coats.

To Test a Scaffold Plank

Block plank to be tested up a foot from the ground placing the supports the same distance apart as the scaffold supports on which it is to be used. Now load the plank with 3 times the load it will be required to support in actual use, placing load as close to the center as possible. At the slightest sign of weakness, discard the plank and mark it so no one else will use it as a scaffold plank.

National Safety Council Safety Instruction Card No. 15.

Thawing Frozen Pipes Inside Buildings

Bad fires are sometimes caused when open flames are employed to thaw frozen water or heating pipes inside of buildings.

If combustible materials are stored near the pipes, the materials may catch fire before it is realized that the flame is hot enough to be dangerous.

The safe way under these circumstances is to use hot water.

1. Wrap the frozen section of the pipe with cloths and pour hot water upon them until the ice gives way.
2. Harm to the floor may be avoided by catching the water in buckets or tubs, or by covering the floor with heavy rags or rugs which will absorb the water.

Never use an open flame to thaw frozen pipes inside of a building. Even though the flame may not cause a fire, its sudden local heat on metal may cause the pipe or pipe fittings to break and flood the premises with water.

National Safety Council Safety Instruction Card No. 131.

Wind Force

The table below is given to provide information for use in the design of buildings to guard against failure from positive wind pressure.

Force of Wind in Pounds per Square Foot

Miles Per Hour	Force Per Square Foot—in Lbs.	Miles Per Hour	Force Per Square Foot—in Lbs.
1	0.005	20	1.969
2	0.020	25	3.075
3	0.044	30	4.429
4	0.079	35	6.027
5	0.123	40	7.873
6	0.177	45	9.963
7	0.241	50	12.30
8	0.315	55	14.9
9	0.400	60	17.71
10	0.492	65	20.85
12	0.708	70	24.1
14	0.964	75	27.7
15	1.107	80	31.49
16	1.25	100	49.2
18	1.55		

National Safety Council Safety Instruction Card No. 270.

Plans for Post-War Building

Essential Points to Consider in Selecting a Plan for a Livestock Barn

1. **The size and design** of the structure will depend upon the number of animals and amount of feed and equipment that will be housed.

2. **Convenience** is the next important consideration as it is a factor in keeping to a minimum the amount of labor and equipment required to care for the animals and perform other operations.

3. **The cost** should be in keeping with the size and income-producing capacity of the farm. In order to provide an adequate, durable building at a minimum cost, careful consideration should be given to the selection of materials and the details of construction. The application of engineering principles aids in determining the correct sizes and grades of materials to be used and how they should be placed to make a strong, durable, economical structure. The strictest economy in every detail is necessary, but an attempt to economize too much may result in the erection of a building that will prove expensive from excessive repair and upkeep costs.

4. **The appearance.** By using carefully prepared plans, the essential features may be embodied in a structure of pleasing appearance, of which one may be proud and which will influence the farmer to greater efforts in beautifying the farmstead. The appearance of farm buildings too often is not considered.

Kentucky Ext'n Bulletin "Plans for Dwellings and Farm Buildings."

HOMEMAKERS' SECTION

Cleaning Silver

If your silverware is not deeply tarnished and you want to avoid the unpleasant task of polishing it in the usual way, allow it to stand one hour in potato water. When it is removed and dried it shines like new.

Dry Clean Lard Buckets

Before washing lard buckets that are wanted for another use warm the bucket and rub with corn meal or bran. The bucket will then wash more easily.

Cleans Milk Strainer Screens

It has been found that steel wool is very effective in cleaning milk strainer screens.

Salt Conditioners

If your salt sticks during damp weather, a teaspoonful of cornstarch thoroughly mixed with each cup of salt will recondition it to a free-flowing state.

To keep salt from caking in salt shakers, add several grains of rice. Every time the salt shaker is shaken the rice will break up any tendency of the salt to start caking.

Stops Corroding of Shaker Tops

Metal tops on salt shakers often corrode because of the salt. This can be stopped by covering the inside of the shaker top with melted paraffin. Before the paraffin has set, open the holes by punching them out with a pin or toothpick.

Funnel Separates Eggs

A speck of yolk left in the white of an egg will prevent the white from whipping stiff. If you have trouble separating the yolk and white in the usual way try breaking the egg into a funnel. The white will run through while the yolk remains behind in the funnel.

Storing Lemons

Lemons that are to be stored for some time will keep better if they are coated lightly with melted paraffin. The paraffin can be applied best with a small brush. When they are to be used, the paraffin can be removed by heating slightly. The paraffin will then roll off or can be wiped off.

Remove Lettering from Sacks

Cloth flour sack material can be put to many uses if the printing is removed. This can be done by dipping the sacks in kerosene oil, washing thoroughly in cold water and then boiling.

Keep Laundry from Freezing to Line

In cold weather laundry hung outside may freeze to the line and clothespins. This can be overcome by boiling the clothesline and clothespins in salt water for about a half-hour.

Roll Lines Without Kinks

To coil clothesline, wire or rubber hose so that it will not kink or twist, try rolling towards you instead of from you.

Adhesive Tape Saves Sheets

Here are two new uses for adhesive tape, that multi-purpose household necessity. Pasted around the corners of bed springs and wherever there are sharp projections it will prevent the sheets from getting caught and torn.

Pieces of adhesive tape pasted on the bottoms of baby's shoes will help keep him from slipping while he is learning to walk.

Makes Ironing Easier

Beeswax or paraffin, of course, makes the iron glide more smoothly. But too much is just as annoying as too little, and the wax should be handy to the ironing board so that the minute quantity needed can be applied easily. Here is the way to always have the wax handy and apply just the right amount to the iron. In one end of the ironing board bore a few holes about one-half inch deep. Fill the holes with beeswax or paraffin and cover them with two thicknesses of muslin. Rubbing the hot iron over the muslin will bring up just enough wax to make the iron work smoothly.

Put Rubber Cap on Broom Handle

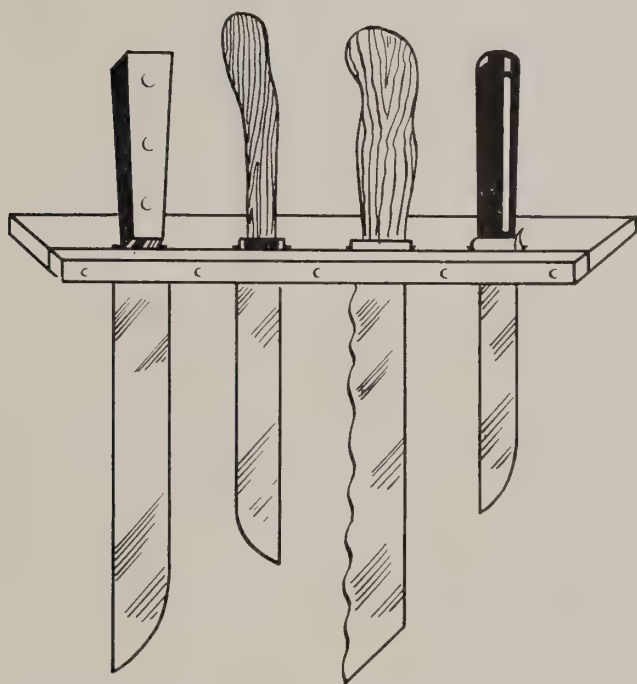
A rubber cap of the kind used on the end of crutches will prevent your broom from sliding and falling down when leaned against a wall or door. Then too, it will not mar wall paper, varnished or painted woodwork or anything else with which it comes in contact. Such a cap can be obtained at most any drug store.

Removing Oil from Wool

To remove oil and grease stains from wool rugs and garments all you need is a blotter and a warm iron. Place the blotter over the grease spot and set the warm iron on top of the blotter. The heat will draw the oil or grease up into the blotter. Repeat the operation several times using a clean portion of the blotter each time.

Another method that has been used successfully, particularly in the case of road oil tracked in upon a rug, is to spread cornstarch over the spots and allow it to remain for an hour. The cornstarch will soak up the oil and when it is swept off the spots will have gone from the rug.

Prevents Cut Fingers



Searching through a drawer full of sharp knives looking for the one you want is risky business. A handy knife rack such as illustrated will be a safety measure and a time saver. The back board is notched to fit various size knives and then a thin front strip is attached with screws. The whole can be mounted on the wall with brackets. Any handy man will be able to make you one that will just fit your needs.

Dry Removal of Paint

Here is a formula for a paint remover that is worked after it has dried. The advantages of such a procedure are obvious.

To mix the remover take five parts waterglass and add one part of soda lye and one part of ammonia. Apply the remover to the surface from which paint or varnish is to be removed, using an old brush as the lye may injure the bristles. When the remover has dried, the paint or varnish may be rubbed off. Should some stick, make another application and repeat the operation. With such an easy procedure there is no excuse for wasting materials by applying paint or varnish over old checked or peeling paint.

Pick Up Glass Slivers

When glass shatters there are frequently a lot of very fine slivers that are very difficult to pick up without danger of getting them into your fingers and, of course, there is always the danger to youngsters if all these small slivers are not collected. The slivers can be safely picked up with a moist piece of absorbent cotton.

Marble in Teakettle Stops Liming

The nuisance of lime deposits on the inside of your teakettle can be overcome by keeping a marble in it. The marble will collect the lime and prevent the deposits.

To Make Casters Stay in Furniture

If you are troubled by a loose caster that keeps falling out of some piece of furniture every time it is moved, try this. Remove the caster and pour melted paraffin in the hole. While the paraffin is still warm push the caster back into place. Allow it to set firmly before setting the piece of furniture upright again.

Keep Glass Clean When Painting

When painting window frames it is sometimes difficult to keep the paint from getting on the window glass. If, before starting to paint, the glass is rubbed lightly with petroleum jelly, paint can be easily removed where it has smeared on the glass. Be careful not to get any of the petroleum jelly on the surface to be painted.

Stop Rugs from Slipping

Small scatter rugs on polished floors can be very dangerous to life and limb because they slip so easily. This condition can be corrected by sewing old jar rubbers to the underside corners of the rug.

Stops Water Running Up Your Sleeve

If you are annoyed by having water run up your sleeve while you are washing ceilings, try tying a rag around your arm at the wrist. This absorbs the water as it runs down from your hand.

Oilcloth Mending Trick

Your ever-handy, ever-useful roll of adhesive tape will come to the rescue to mend oilcloth that has been accidentally cut or torn. By putting a piece of adhesive tape over the cut on the wrong side and pressing the edges of the cut tightly against it you can prevent the cut from becoming an unsightly hole.

CONSERVATION SECTION

(This section is added as a new feature to help farmers protect and prolong the life of vital equipment made irreplaceable or difficult to replace by the war.)

Used Crankcase Oil Preserves Tools

Use your old crankcase oil to keep tools such as hoes, shovels and spades from rusting. They'll work better and easier if kept in good condition, too.

Put the used crankcase oil into a small drum from which the head has been removed or an old milk can from which the top has been cut off above the handles. Handles are left on to make the can easier to handle. After cleaning and drying the tools dip them into the drum or can which should be at least half full of oil. Drain the tools over the can for a few moments after dipping, then return them to their normal storage place. The film of oil remaining on the tools will act as a guard against rust. This method is much easier and more convenient than wiping tools with an oily rag.

Preserve Manure Spreader

Here's another good use for used transmission oil drained from your car. Coat the chains on your manure spreader with it. This will make them work much more smoothly and increase the life of the chains.

Used Oil Preserves Implements

There seem to be endless uses for used crankcase oil—and here's another. When it is necessary to leave plows, discs, etc., in the field overnight, coat the moldboards, discs, and other exposed working surfaces with oil. If it rains during the night, the oil protects these surfaces and there is no delay in starting work in the morning.

Oil Tire Chains

If you keep a can of used car oil around for dipping tools, etc., try dipping your tire chains before putting them away. Then hang them up for storage. You will find they will be easier to handle when mounting because they will be more flexible and that this treatment will materially lengthen their life.

Oil Treat Ropes

Occasional treatment of ropes, especially hay carrier ropes, with linseed oil will appreciably lengthen their life. Apply by drawing rope through oil soaked rag. Remember to dispose of rag, as linseed oil is a source of spontaneous combustion.

Oil Coating with Brush

A bucket of oil and an old paint brush can do your heavy oiling jobs quicker, easier and without getting oil on the hands. For instance, using old heavy oil you can quickly coat a plowshare or cultivator shovels. This system works particularly well when oiling the sickle on a mower and is about the easiest way to oil the springs on a car. For car springs a lighter oil should be used, separator oil being preferred.

Prevent Paint Scum

Lots of paint is wasted by the scum that forms over the top of paint in partially-filled cans. To prevent such loss, melt a little paraffine, and cover the surface of the paint.

Saving Old Paint Brushes

If you have some old paint brushes that are no longer usable because they have hardened, don't throw them away. Try softening them this way. Put the brushes into boiling vinegar and allow to simmer over a slow fire for a few minutes. Then wash out the brushes in soap suds. This will, in most cases, make the brushes soft, pliable and usable again.

Wire Wrap Saves Axe Handle

Splitting wood often weakens and breaks an axe handle at the point where it enters the axe head. To protect and reinforce the handle at this point wrap with fine wire for about three inches, starting at the head.

Fix Leaking Water Tank

If your open water tank is continually developing leaks in the bottom, fix it permanently with a cement bottom. Clean the bottom of the tank carefully and cover with about one-half inch of rich concrete. Use washed sand in the cement because it provides a smoother surface. If this is done properly and carefully your tank will give you extra trouble-free years of service.

How to Store Canvas

If you have been troubled by mice destroying your binder canvasses when not in use, try storing them this way. Suspend two barrel hoops from the ceiling of the machine shed and lay your canvasses in the hoops. This will protect your canvasses.

Care of a Manila Rope

How long a rope will last depends on the treatment it receives, as well as the quality of the rope. Here is some information as to treatment.

1. Do not drag rope over ground, rough or sharp objects, or over another part of the rope unnecessarily.
2. Care should be taken in making a rope fast. All sharp bends over unyielding surfaces should be avoided, a smooth round surface of sufficient diameter should be chosen so as not to put an excessive strain on some of the fibres.
3. Learn the rated strength of the rope, and stay within this limit as overloading a rope weakens it.
4. When there are knots or splices to be done, have some one that knows how do the work.
5. Do not put any strain on a rope with a kink in it. Wet ropes are especially likely to kink.
6. Keep rope from freezing if possible. If it does freeze, thaw it slowly, keeping away from steam.
7. High temperatures rapidly destroy rope.
8. Alternate wetting and drying of a rope is more damaging than continually being wet.
9. If rope is going to be subjected to weather continually, it should be treated with preservative before being used, and then from time to time to keep it in condition.
10. In storing a rope, be sure that it is dry and clean, and that store room is as free from dust and dirt as is possible.
11. Be sure that there is no acid in store room, and that none has been stored there before.
12. Small ropes should be either tied in loose loops and hung up, or rolled on a suitable spool. Large ropes should be stored in coils on gratings raised above the floor.

National Safety Council Safety Instruction Card No. 203.

Ladder Maintenance

Care of ladders is important to personal safety as well as durability and economy. Here are some good maintenance suggestions:

1. Inspect ladders at frequent regular intervals; if the ladder is found defective, either repair or discard it.
2. Use shellac, varnish, or two coats of oil as a preservative; paint conceals defects.
3. Keep ladders clean.
4. Do not lay ladders on wet ground, or leave them exposed to the weather. Ladders lying on the floor or ground may cause persons to trip and fall; or they may be run over by trucks and damaged.
5. Roughen metal ladder rungs to prevent slipping.
6. Never leave a ladder where it may fall.

7. Store ladders in a cool dry place, either lying on their sides or hanging by their rails from several wall brackets in a horizontal position. Take care, however, that these suspended ladders do not warp.

National Safety Council Safety Instruction Card No. 340.

Care of Belting

Don't abuse the belt. Keep it soft and pliable and clean.

Don't overload the belt. See that it is proportioned to the work required of it.

Don't take it for granted that your line shafting and pulleys are in line simply because they once were. See that they are kept in line.

Don't let your belts get dirty. Keep them clean.

Don't use small pulleys. Use big pulleys whenever possible, as the larger the pulley, both driver and driven, the better will be the results.

Recommended Air Pressures for Tires Used on Farm Tractors

FRONT TIRES—ALL SIZES

- 1.—4-Ply Tires28 Lbs.
- 2.—6-Ply Tires36 Lbs.

REAR TIRES—ALL SIZES

- 3.—Minimum air pressure*12 Lbs.
- 4.—When plowing, increase air pressure in furrow wheel tire 4 Lbs.
- 5.—When special heavy wheels are used, or heavy implements such as corn-pickers, bedders, etc., are carried on the tractor, inflation pressure must be increased. Contact the tractor dealer or manufacturer for this information.

* Small Section Economy Duals up to and including 5.50-44 and 7.44 require a minimum air pressure of 20 Lbs.

Recommended Air Pressures for Tires Used on Farm Implements

TIRE SIZE	AIR PRESSURE			
	ALL RIM DIAMETERS	4 PLY	6 PLY	8 PLY 10 PLY
5.00-5.50		32	44	
6.00-6.50-7.00		28	40	56
7.50-8.25		24	36	48
9.00		20	32	44 56
11.25			28	36 44
12.75			24	32

Calcium Chloride Solutions for Rubber Tractor Tires

From the following tables, it is easy to figure the exact amount of calcium chloride to be added to water for the more popular sizes of tractor tires. In mixing, do not attempt to pour water onto the calcium chloride as it will cause caking and require a much longer time for the solution to become thoroughly mixed. Instead, pour the calcium chloride into the water. After the solution is mixed, it should be allowed to cool, as considerable heat is generated when calcium chloride is added to water. Keep solution away from ignition, wiring, and clothes.

Conventional Tractor Tires

	Water Only		Safe to 20° Below Zero			Safe to 40° Below Zero		
			Use This Amount Calcium Chloride Lbs.	Dissolve in this Amount Water Gals.	Total Weight in Tire Lbs.	Use This Amount Calcium Chloride Lbs.	Dissolve in this Amount Water Gals.	Total Weight in Tire Lbs.
	Lbs.	Gals.						
4.00 x 15	17	2.04	3.9	2.0	19.3	6.2	1.7	21
5.00 x 15	24	2.88	5.5	2.6	27.1	8.7	2.5	29
5.50 x 16	36	4.33	8.2	4.0	41.5	13.0	3.7	43
6.00 x 12	32	3.84	7.3	3.6	36.4	11.6	3.3	39
6.00 x 16	48	5.76	10.9	5.3	55.0	17.4	4.9	58
6.50 x 16	58	6.95	13.2	6.4	66.0	21.0	5.9	70
7.50 x 10	40	4.8	9.1	4.4	45.7	14.5	4.1	48
7.50 x 16	75	9.0	17.1	8.3	86.1	27.2	7.7	91
7.50 x 18	80	9.6	18.2	8.8	91.4	29.0	8.2	97
7.50 x 24	110	13.2	25.1	12.1	126.0	39.9	11.2	133
7.50 x 36	150	18.0	34.2	16.5	171.0	54.4	15.3	182
7.50 x 40	165	19.8	37.6	18.2	189.0	59.8	16.8	200
8.25 x 36	170	20.4	38.8	18.7	195.0	61.6	17.3	206
8.25 x 40	200	24.0	45.6	22.0	228.0	72.5	20.4	242
9.00 x 10	54	6.5	12.3	5.9	61.5	19.5	5.5	65
9.00 x 24	150	18.0	34.2	16.5	171.0	54.4	15.3	182
9.00 x 28	170	20.4	38.8	18.7	195.0	61.6	17.3	206
9.00 x 36	220	26.4	50.2	24.2	253.0	79.7	22.4	266
9.00 x 40	240	28.8	54.7	26.4	275.0	87.0	24.5	291
10.00 x 28	260	31.2	59.3	28.6	296.0	94.2	26.5	314
10.00 x 36	325	39.0	74.1	35.8	372.0	117.8	33.2	394
10.00 x 44	375	45.0	85.4	41.3	430.0	135.6	38.2	454
11.25 x 24	250	30.0	56.9	27.5	285.0	90.6	25.5	303
11.25 x 28	280	33.6	63.8	30.8	319.0	101.4	28.6	339
11.25 x 36	360	43.3	82.1	39.6	410.0	130.3	35.8	436
11.25 x 42	410	49.3	93.4	45.2	467.0	148.4	41.9	497
12.75 x 24	340	40.8	77.5	37.4	389.0	123.2	34.8	413
12.75 x 28	380	45.7	86.6	41.8	434.0	137.6	38.8	461
12.75 x 32	420	50.4	95.8	46.2	481.0	152.1	42.8	508
13.50 x 24	380	45.7	86.6	41.8	434.0	137.6	38.8	461
13.50 x 28	420	50.4	95.8	46.2	481.0	152.1	42.8	508
13.50 x 32	460	55.2	105.0	50.6	527.0	166.6	46.9	557

Wide Base Tractor Tires

7-32	90	10.8	20.5	9.9	103.0	32.6	9.2	109
7-40	120	14.4	27.4	13.2	137.0	43.5	12.2	145
8-32	130	15.6	29.6	14.3	148.0	47.0	13.3	157
8-38	145	17.4	33.0	15.9	165.0	52.5	14.8	175
9-32	170	20.4	38.7	18.7	194.0	61.5	17.4	206
9-38	205	24.6	45.8	22.5	234.0	74.2	20.9	248
10-28	200	24.0	45.6	22.0	228.0	72.5	20.4	242
10-38	260	31.2	59.3	28.6	298.0	94.2	26.5	315
11-26	260	31.2	59.3	28.6	298.0	94.2	26.5	315
11-38	350	42.0	79.8	38.5	401.0	126.8	35.9	424
12-26	300	36.0	68.4	33.0	342.0	108.6	30.6	363
12-38	460	55.2	104.9	50.6	525.0	166.5	46.9	556
13-30	405	48.6	92.1	44.6	465.0	146.4	41.2	490

FARM SAFETY SECTION

(Safety Suggestions given on these pages are reproduced through the courtesy of the National Safety Council—20 North Wacker Drive, Chicago, Illinois)

Home Fire Precautions

Fire threatens disaster to every home. Here are some things to do to prevent home fires:

1. Do not smoke in bed. Put matches, cigar and cigaret butts in metal containers.
2. Completely enclose wood and coal fireplaces with wire screen.
3. Be sure floor lamps and extension cords are in good repair.
4. Disconnect electric appliances as soon as through using them.
5. Burn oily rags. Set oily mops in the open air. Never store easily flammable materials in closets.
6. Never start a fire with gasoline or kerosene
7. If any garment cleaning is done at home, use nothing but non-flammable cleaner; never use gasoline or naptha.
8. If gasoline or kerosene is kept on hand, keep only small quantities, in safety cans, OUTSIDE the house.
9. Clean chimneys and flues annually. Protect woodwork and other flammable parts near furnace or stove with insulation.
10. Place ashes in metal containers; dump ashes where they cannot set fire to anything.

In Case of Fire

When fire is discovered in the day-time, it is usually small. A rug or a heavy garment may smother it; a fire extinguisher may easily put it out.

But if the fire, when discovered, is already large, warn other persons in the house, and summon assistance immediately.

1. If fire-fighting service is available, notify the fire department. If you telephone, explain clearly that you want to report a fire; give the correct location.
2. If at night you smell smoke, do not open your closed door at once. Flame and smoke rushing in about you might be fatal. Feel of the door first; if it is not warm, open it with caution.
3. If there is dense smoke but no flame, get on your hands and knees (the air is purer at the floor level) and crawl to safety. Cover your mouth and nose with a damp cloth, if possible.
4. If your path to house exits is cut off, make a rope of bed-sheets or clothing and let yourself down from a window. Never jump from a window or any other height.

To Avoid Injury When Lifting



1. You may be as strong as an ox but be careful what you lift. Even if your back muscles were made of steel there would be a limit to the strain they would stand.
2. Size up the load before you lift it. Get help if necessary.
3. Lift with your legs and not your back.

Felling Trees Safely

Tree felling is a hazardous job, as may be seen by the fact that it ranks second in accident causes in the logging industry.

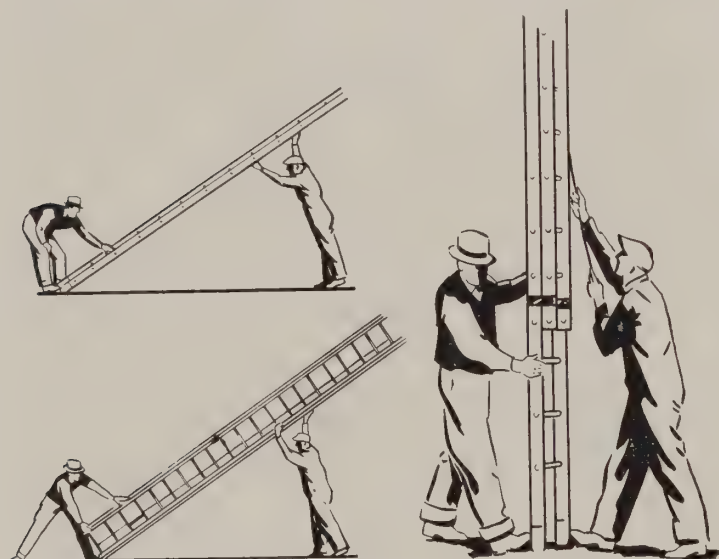
Here are some ways of reducing the hazards:

1. Clear away brush around tree, so there is plenty of room to swing axe.
2. Prepare a path so you can make a quick get-away when tree starts to fall.
3. Line up tree for direction of fall. If there is danger of it striking and damaging any other trees or objects, use tackle to assist in felling.
4. Size up tree for dead timber, removing any that looks dangerous. If there are any wires adjacent, strip off lower limbs so wires won't be pulled down when the tree falls.
5. Make a deep "V" grooved notch on the side you want the tree to fall. This will prevent the danger of kick backs.
6. Give warning when tree starts to fall and get well away—get behind another tree if possible.
7. Look up when tree is falling. Large limbs and tops often break off, falling a good distance from the tree. Be especially on the look-out in a high wind.
8. Keep tools well sharpened. If it is necessary to go up a tree, use a rope looped around the body and the tree for safety.
9. Any tree started to be felled must be safely on the ground before leaving the job at night.

Ladder Safety

Setting Up a Ladder

1. Select a ladder with suitable safety feet; otherwise, block or tie the base, or have someone hold it.
2. Be sure rungs and side rails are in sound condition.
3. Place ladder feet parallel with wall or other solid backing. It is unsafe to rest a ladder against loose boxes, round objects, or other insecure backing, unless it is tied so that it cannot fall.
4. The best angle for a ladder is about 75 degrees with the horizontal. Have the base about $\frac{1}{4}$ of the ladder length out from the bottom of the object it leans against. In other words, place the base of a 12-foot ladder 3 feet from the object it leans against.
5. If the ladder is placed before a doorway, lock the door or have someone guard it. Protect the ladder base from traffic, if necessary.
6. When using a stepladder, make sure it is fully extended before you climb.
7. If an extension ladder is used, follow the sketches and instructions below to avoid accidents when raising and extending it.



- (a) Wait until the ladder is raised to a vertical position, then extend it. Be sure to watch where you put your fingers, lest they be crushed.
- (b) To lower the ladder, simply reverse the operation, but first raise the upper section just enough to release the hook so it can be lowered.

Climbing Ladders

1. If your shoes are muddy or otherwise slippery, clean them before you climb.
2. Always face the ladder and hold on with both hands, whether climbing up or down.
3. Carry tools in suitable pockets; or have tools and all other objects hoisted with rope and bucket.

Working from Ladders

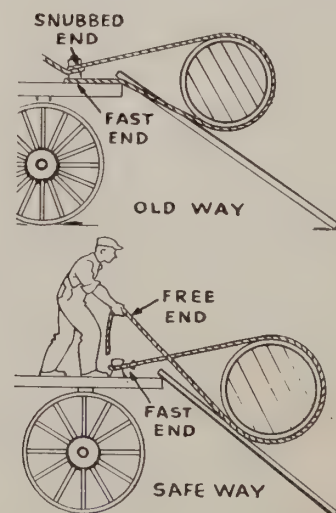
1. Work facing the ladder and hold on with one hand.
2. Use a safety belt if the character of the work requires it.
3. It is dangerous to reach out too far from a ladder in any direction; move the ladder as the work may require.
4. Avoid the use of two ladders spliced together; get one long enough to reach the job.
5. It is unsafe to use a ladder as a horizontal member of a scaffold.
6. When using ladders on roofs or other high places, lash them securely. Do not work in a high wind.

Brush Painting from Ladders

Brush painters should take every precaution in climbing and working from ladders. Important safety suggestions include the following:

1. Have plenty of clearance on each side, also in front of and behind the ladder.
2. Do not lean a ladder against window sash; fasten a board to the ladder top as a bearing on each side of the window frame.
3. Hang the paint bucket from a ladder rung by a suitable hook; hold to the ladder with one hand while painting.
4. It is dangerous to reach out too far in any direction from a ladder; climb down and move the ladder, as may be necessary.

To Skid a Cylindrical Object Safely



Fasten one end of rope as shown, then pass it over and under the barrel, tank, roll or whatever it may be and keep a tension on the free end. This method requires little strength because the cylindrical object slides down the skid, furnishing its own friction.

Household Safety

Safety in the Kitchen

1. Have the stove fitted with safety cocks, so that gas petcocks cannot be turned without releasing a clip.
2. Keep the handles of cooking pans and pots turned so that children cannot grasp them.
3. Place matches securely beyond a child's reach, and teach him to respect and avoid fire.
4. Place sharp knives well back on the table; do not carry knives about unnecessarily; keep them in drawers.
5. Open the oven door and leave it open for several minutes before turning on gas and applying a match.
6. Cover the hand with a cloth before opening a steaming vessel or roaster; lift the far side of the cover first. Use a cloth or pad to lift any hot pan or other vessel.
7. Beware of hot grease spattering on hands or arms; apply first aid, or summon a doctor for any serious burn or cut.
8. Take time and care in using grinders, beaters, slicers and all other power-driven appliances; be sure the extension cord is of approved make and in good condition.
9. Open tin cans with a proper appliance; dispose of bottles and similar refuse where children cannot find them.

Bathroom Precautions

So many serious accidents occur in the bathroom that it is well called the most dangerous room in the home.

1. Test the water before you get into a tub or under the shower; bath water can scald you fatally.
2. Have a substantial hand-hold on the wall beside the tub or inside the shower; anchor the bath rug or use a vacuum grip rubber mat.
3. Use a rigid soap container; never get into the tub while a cake of soap is loose in the bottom.
4. Use porcelain, rather than metal, electric light fixtures.
5. If you cannot do away with the brass chains of electric lights, insert an insulator near each socket, or tie a pull string to the end.
6. If any electric appliance is used in the bathroom, place it where it cannot be reached from the tub or wash stand; use only the best extension cord.
7. Never touch a light switch, an electric appliance or any other electrical apparatus with wet or damp hands.
8. Make it a rule never to leave a small child alone in the bath tub—or even in the bathroom by himself.

Basement Safety

1. Provide basement stairs with handrails. Keep all objects off the steps. Have sufficient light on stairs before descending.
2. Rags, carpets and rugs, papers and many other articles stored in basements are fire hazards. Clean them out frequently.
3. Never use gasoline or kerosene to start a fire. Never use flammable cleaning fluids in the basement. Store gasoline or kerosene in carefully marked metal covered cans outside the house.
4. Deposit ashes and cinders outside the basement in metal cans with metal covers.
5. Protect woodwork near furnace and heating pipes with asbestos or metal screens. Do not store coal or other combustible materials near furnace or heating pipes.
6. Clean out furnace flues before fires are needed.
7. Install safety valves on hot water supply tanks and on steam heating boilers.
8. Always replace a blown electric fuse with one of proper size. Never use a penny or other makeshift.
9. Use electric extension cords only of approved make and sound condition. Do not allow cord to lie in water. Never stand on a wet spot or in contact with water pipes or other pipes having a ground connection when handling electric equipment.
10. Report promptly all leaks or other defects in gas or electric equipment to the public utility company. Never look for a gas leak with a match.

Safety of the Small Child

1. Select toys and playthings with the safety of children always in mind.
2. Do not allow children to play with metal toys which have sharp points or edges.
3. Serious falls may be caused by toys left on steps, stairways and walks.
4. Small children have a way of putting anything into their mouths and are easily choked; keep all small objects out of their reach.
5. Avoid throwing razor blades, bottles and medicines into waste baskets; children may find them.
6. Keep matches where children cannot get them; put the sticks of "dead" matches, cigar and cigaret butts into closed containers.
7. Do not permit small children to play with tools; or to play where tools may fall on them.
8. Protect children from open fires, from kitchen stoves and all cooking vessels, and from kitchen utensils and other objects which might fall on them or be pulled over on them.

REFERENCE SECTION

U. S. Government Land Measure

A township—36 sections, each a mile square.

A section—640 acres.

A quarter section—half a mile square, 160 acres.

An eighth section, half a mile long, north and south, and a quarter of a mile wide—80 acres.

A sixteenth section, a quarter of a mile square—40 acres.

The sections are all numbered 1 to 36, commencing at the northeast corner.

The sections are divided into quarters, which are named by the cardinal points. The quarters are divided in the same way. The description of a forty-acre lot would read: the south half of the west half of the southwest quarter of section 1 in township 24, north of range 7 west, or, as the case might be, and sometimes will fall short and sometimes overrun the number of acres it is supposed to contain.

NOTE—In most of the Western states, where all of the land was laid out by the Government, all titles, except in city lots, are passed by description, as under the Government survey, and there a square of 6 miles, or 36 square miles, is one township.

To Find Number of Acres in a Field

To find the number of acres in a body of land, multiply the length by the width (in rods) and divide the product by 160. When the opposite sides are unequal, add them, and take half the sum for the mean length or width.

Contents of Fields and Lots

10 rods x 16	rods = 1 acre
8 rods x 20	rods = 1 acre
5 rods x 32	rods = 1 acre
4 rods x 40	rods = 1 acre
5 yds. x 968	yds. = 1 acre
10 yds. x 484	yds. = 1 acre
20 yds. x 242	yds. = 1 acre
40 yds. x 121	yds. = 1 acre
70 yds. x 69 1/7	yds. = 1 acre
80 yds. x 60 1/2	yds. = 1 acre
220 feet x 198	feet = 1 acre
440 feet x 99	feet = 1 acre
240 feet x 181 1/2	feet = 1 acre
120 feet x 363	feet = 1 acre
110 feet x 396	feet = 1 acre
60 feet x 726	feet = 1 acre
200 feet x 108 9/10	feet = 1/2 acre
100 feet x 145 2/10	feet = 1/3 acre
100 feet x 108 9/10	feet = 1/4 acre

Acreage per Mile of Various Widths

Width	Acres Per Mile	Width	Acres Per Mile
1 foot	0.121	15 feet	1.815
5 feet	0.605	16 feet	1.936
8 feet	0.968	18 feet	2.178
10 feet	1.21	20 feet	2.42
12 feet	1.452	24 feet	2.904
14 feet	1.694	25 feet	3.025

Miles Traveled in Plowing an Acre

Width of Furrow, Inches	Miles
10	9-9/10
11	9
12	8-1/4
13	7-1/2
14	7
15	6-1/2
16	6-1/6

Miles Traveled in Planting an Acre 3'-6" Rows

1-Row Planter	2.34 miles
2-Row Planter	1.17 miles
3-Row Planter	.78 miles

Acres Planted in Traveling One Mile 3'-6" Rows

1-Row Planter	.42 acres
2-Row Planter	.84 acres
3-Row Planter	1.26 acres

There are 10,667 stalks in an acre planted in 3'-6" rows, three stalks to the hill, hills 3'-6" apart, or drilled one stalk every 14 inches.

There are 3,556 hills in an acre planted in 3'-6" rows, hills 3'-6" apart.

Plowing Accomplished with Tractor in 10-Hour Day, at Various Speeds

Speed Miles Per Hr.	ACRES PLOWED		
	Two 12" Plows	Two 14" Plows	Two 16" Plows
17/8	4.52	5.28	6.04
2	4.84	5.64	6.46
2 1/4	5.45	6.35	7.27
2 1/2	6.05	7.05	8.07

Average Draft of Plows

RULE: Multiply cross section of furrow in sq. in. by the resistance per sq. in. of soil.

Average Resistance of Soils

Sand	2 to 3 lbs.
Silt Loam	3 to 4 lbs.
Light Clay	6 lbs.
Medium Heavy Clay	8 lbs.
Prairie or Virgin Soil	15 lbs.
Dry Land Gumbo	20 lbs.

Example—Maximum draft of one 14" plow, 7" deep, silt loam. $7 \times 14 \times 4 = 392$ lbs.

Pounds Pull Required

	Lbs.
1—14" plow, 7" deep—Corn stubble	350
1—14" plow, 7" deep—Wheat stubble	400
1—14" plow, 7" deep—Clover sod	450
1—14" plow, 7" deep—Grass	600
1—14" plow, 3½" deep—Breaking	750

Miles per Hour Reduced to Feet per Minute

1½ M. P. H. = 132 F. P. M.
1¾ M. P. H. = 152 F. P. M.
2 M. P. H. = 176 F. P. M.
2¼ M. P. H. = 198 F. P. M.
2½ M. P. H. = 220 F. P. M.
2¾ M. P. H. = 242 F. P. M.
3 M. P. H. = 264 F. P. M.

Draw Bar Horse Power Required at Two

Miles per Hour

1500 lbs. = 8 H. P.
1875 lbs. = 10 H. P.
2250 lbs. = 12 H. P.
2812½ lbs. = 15 H. P.

Capacities of Cylindrical Tanks

Tank Diam. In.	Two Bumped Heads Gal.	2 in. of Length Gal.	1 Foot of Length Gal.
12	0.80	0.81	4.9
14	1.20	1.10	6.6
16	2.02	1.50	9.0
18	2.65	1.83	11.0
20	3.17	2.25	13.5
22	4.96	2.73	16.4
24	6.73	3.25	19.5
30	18.18	5.08	30.5
36	23.26	7.28	43.7
42	34.00	10.00	60.0
48	51.61	13.00	78.0
54	74.50	16.16	97.0
60	105.00	20.50	123.0
66	133.50	24.33	148.0
72	175.0	29.33	176.0
78	227.0	34.16	205.0
84	285.0	40.00	240.0
96	415.0	50.83	305.0
108	600.0	65.67	394.0
120	815.0	81.67	490.0
132	1073.0	98.33	590.0
144	1400.0	100.00	700.0

To Find Capacity of a Cylindrical Tank in Gallons

To find the capacity of cylindrical tanks, square the diameter in inches, multiply by the height in inches, and this product by the decimal .34. Point off four decimals and you have the capacity in gallons.

Calculating Number of Gallons in a Partially Filled Horizontal Cylindrical Tank

H=depth (in hundredths of the diameter) of the liquid.

P=portion of the total tank capacity represented by the liquid.

"H"	"P"	"H"	"P"	"H"	"P"
0.01	0.002	0.35	0.312	0.68	0.725
0.02	0.005			0.69	0.738
0.03	0.008	0.36	0.323	0.70	0.748
0.04	0.014	0.37	0.336		
0.05	0.018	0.38	0.348	0.71	0.760
		0.39	0.361	0.72	0.772
0.06	0.021	0.40	0.373	0.73	0.783
0.07	0.030			0.74	0.794
0.08	0.037	0.41	0.385	0.75	0.805
0.09	0.044	0.42	0.398		
0.10	0.052	0.43	0.409	0.76	0.816
		0.44	0.422	0.77	0.827
0.11	0.060	0.45	0.436	0.78	0.837
0.12	0.068			0.79	0.848
0.13	0.076	0.46	0.448	0.80	0.858
0.14	0.086	0.47	0.460		
0.15	0.093	0.48	0.472	0.81	0.868
		0.49	0.486	0.82	0.878
0.16	0.103	0.50	0.500	0.83	0.887
0.17	0.113			0.84	0.897
0.18	0.122	0.51	0.514	0.85	0.907
0.19	0.132	0.52	0.528		
0.20	0.142	0.53	0.540	0.86	0.914
		0.54	0.552	0.87	0.924
0.21	0.152	0.55	0.564	0.88	0.932
0.22	0.163			0.89	0.940
0.23	0.173	0.56	0.578	0.90	0.948
0.24	0.184	0.57	0.591		
0.25	0.195	0.58	0.602	0.91	0.956
		0.59	0.615	0.92	0.963
0.26	0.206	0.60	0.627	0.93	0.970
0.27	0.217			0.94	0.979
0.28	0.228	0.61	0.639	0.95	0.982
0.29	0.240	0.62	0.652		
0.30	0.252	0.63	0.664	0.96	0.986
		0.64	0.677	0.97	0.992
0.31	0.262	0.65	0.688	0.98	0.995
0.32	0.275			0.99	0.998
0.33	0.287	0.66	0.701	1.00	1.000
0.34	0.299	0.67	0.711		

Example: Water is 24 inches deep in a horizontal tank 30 inches in diameter and 4 feet long, having a capacity of 122 gallons.

$$H = \frac{\text{depth of liquid}}{\text{diameter}} = \frac{24}{30} = .80$$

For .80, P=0.858

Multiplying 122 gallons by .858 gives 104.676 gallons—the amount of water in the tank when it is filled to a depth of 24 inches.

To Find the Capacity of a Square Tank in Gallons

Rule—Multiply the area of the bottom by the height in order to secure the cubic feet. Multiply the cubic feet by $7\frac{1}{2}$ (exact 7.48) and the result will be the number of gallons. For the contents in barrels, multiply the cubic feet by .2375.

To Find Contents of Barrels and Casks in Gallons

Multiply the square of the mean diameter in inches by the depth in inches and the product by .0034 to find the capacity of a barrel or cask in gallons.

Capacity of Cisterns in Barrels

Each Foot in Depth of a Circular Cistern

5 ft. in diam. holds	4.66 bbls.
6 ft. in diam. holds	6.71 bbls.
7 ft. in diam. holds	9.13 bbls.
8 ft. in diam. holds	11.93 bbls.
9 ft. in diam. holds	15.10 bbls.
10 ft. in diam. holds	18.65 bbls.

Each Foot in Depth of a Square Cistern

5 ft. x 5 ft. holds	5.92 bbls.
6 ft. x 6 ft. holds	8.54 bbls.
7 ft. x 7 ft. holds	11.63 bbls.
8 ft. x 8 ft. holds	15.19 bbls.
9 ft. x 9 ft. holds	19.39 bbls.
10 ft. x 10 ft. holds	23.74 bbls.

Approximate Capacity of Cylindrical Silos, for Well-Matured Corn Silage, in Tons

Depth of Silo, Feet	INSIDE DIAMETER OF SILO, FEET											
	10	12	14	15	16	18	20	21	22	23	24	
20	26	38	51	59	67	85	105	115	127	138	151	
21	28	40	55	63	72	91	112	123	135	148	161	
22	30	43	59	67	77	97	120	132	145	158	172	
23	32	46	62	72	82	103	128	141	154	169	184	
24	34	49	66	76	87	110	135	149	164	179	195	
25	36	52	70	81	90	116	143	158	174	190	206	
26	38	55	74	85	97	123	152	168	184	201	219	
27	40	58	78	90	103	130	160	177	194	212	231	
28	42	61	83	95	108	137	169	186	204	223	243	
29	45	64	88	100	114	144	178	196	215	235	265	
30	47	68	93	105	119	151	187	206	226	247	269	
31	49	70	96	110	125	158	195	215	236	258	282	
32	51	73	101	115	131	166	205	226	258	271	295	

Silo Information

Dimensions	Capacity in Tons	Acres to fill— 15 Tons to Acre	Cows it will keep six months, 40 lbs. feed per day
10 x 20	28	3	8
12 x 20	40	3	11
12 x 24	49	$3\frac{2}{5}$	13
12 x 28	60	4	15
14 x 22	61	$4\frac{1}{2}$	17
14 x 24	67	$4\frac{2}{3}$	19
14 x 28	83	$5\frac{2}{3}$	22
14 x 30	93	6	23
16 x 24	87	$6\frac{2}{5}$	24
16 x 26	97	7	26
16 x 30	119	8	30
18 x 30	151	$10\frac{1}{5}$	37
18 x 36	189	$12\frac{1}{3}$	45

Capacity of Corn Cribs (Dry Corn)

(Height, 10 Feet.)

Width —Feet	LENGTH—FEET													
	$\frac{1}{2}$	1	12	14	16	18	20	22	24	28	32	36	48	64
6	13	27	320	373	427	480	533	587	640	747	853	960	1280	1707
$6\frac{1}{4}$	13	28	333	389	444	500	556	611	667	778	889	1000	1333	1777
$6\frac{1}{2}$	14	29	347	404	462	520	578	636	693	809	924	1040	1387	1849
$6\frac{3}{4}$	15	30	360	420	480	540	600	660	720	840	960	1080	1440	1920
7	16	31	373	436	498	560	622	684	747	871	996	1120	1493	1991
$7\frac{1}{4}$	16	32	387	451	516	580	644	709	773	902	1031	1160	1547	2062
$7\frac{1}{2}$	17	33	400	467	533	600	667	733	800	933	1067	1200	1600	2133
$7\frac{3}{4}$	17	34	413	482	551	620	689	758	827	964	1102	1240	1653	2204
8	18	36	427	498	569	640	711	782	853	996	1138	1280	1707	2276
$8\frac{1}{2}$	19	38	453	529	604	680	756	831	907	1058	1209	1360	1813	2418
9	20	40	480	560	640	720	800	880	960	1120	1280	1440	1920	2560
10	22	44	533	622	711	800	889	978	1067	1244	1422	1600	2133	2844

The length is found at top of table, the width in left-hand column—the height being taken at 10 ft. Thus, a crib 24 ft. long, $7\frac{1}{2}$ ft. wide and 10 ft. high, will hold 800 bushels of ear corn, reckoning $2\frac{1}{4}$ cubic feet to hold a bushel. If not 10 feet high, multiply by the given height and cut off right-hand figure. If above crib were only 7 ft. high, it would hold 800×7 , equals 560 (0.) bu., etc. The same space will hold $1\frac{4}{5}$ times as much grain as ear corn. Thus, a crib that holds 800 bushels of ear corn will hold $800 \times 1\frac{4}{5} = 1440$ bushels of grain.

Capacity of Circular Metal Corn Cribs

Capacity Shell Corn Bushels	Capacity Ear Corn Bushels	Diameter	Height
200	115	6'-4"	8'
325	187	8'-0"	8'
455	266	9'-6"	8'
570	327	9'-6"	10'
635	390	11'-2"	8'
785	475	11'-2"	10'
905	530	12'-0"	10'
1100	600	12'-9"	10'

Ear corn 4000 cu. in. per bushel of 70 pounds.
Shell corn at 2150 cu. in. per bushel.

Capacity of Circular Grain Bins

Capacity Shell Corn Bushels	Diameter	Height
325	8'-0"	8'
455	9'-6"	8'
570	9'-6"	10'
635	11'-2"	8'
725	12'-0"	8'
950	13'-7"	8'
1200	16'-0"	8'
1500	16'-0"	10'

Shell corn at 2150 cu. in. per bushel.

To Find Number of Bushels of Grain or Shelled Corn in a Bin or Wagon Box

Multiply the number of cubic feet (length x width x depth) by .8 to determine the number of bushels in a rectangular bin or box.

Capacity of Boxes

- A box 24 x 24 x 14.7 inches will hold a barrel of 31½ gallons.
- A box 15 x 14 x 11 inches will hold 10 gallons.
- A box 8¼ x 7 x 4 inches will hold a gallon.
- A box 4 x 4 x 3.6 inches will hold a quart.
- A box 24 x 28 x 16 inches will hold five bushels.
- A box 16 x 12 x 11.2 inches will hold a bushel.
- A box 12 x 11.2 x 8 inches will hold a half-bushel.
- A box 7 x 6.4 x 12 inches will hold a peck.
- A box 8.4 x 8 x 4 inches will hold a peck, or four dry quarts.
- A box 6 x 5.6 x 4 inches deep will hold a half-gallon.

Globular Measure

To find the surface of a globe, multiply the square of the diameter by 3.1416.

To find the volume of a globe, multiply the cube of the diameter by .5236.

To Find Height of Tree or Building

Set up a stick and measure its shadow. Measure length of shadow of tree. Length of shadow of tree, times height of stick divided by length of shadow of stick equals height of tree.

To Find Contents of a Cordwood Pile

To find the contents of a pile of cordwood, multiply the length, width and height together and divide the product by 128. This will give you the number of cords.

Relation of Diameter to Capacity of Pipe

Doubling the diameter of a pipe or cylindrical vessel increases its capacity four times.

Weights of Fuels (Baume)

	Test	Lbs. per Pint	Lbs. per Gal.
Gasoline	70	.72875	5.83
Gasoline	68	.7425	5.94
Gasoline	62	.76875	6.14
Naphtha	56	.79125	6.33
Distillate	51	.81375	6.51
Kerosene	48	.82625	6.61
Kerosene	43	.84875	6.79

Tap Drill Sizes

Table below gives size of drill to be used for drilling holes to be tapped to take standard size bolts. Fine thread is American National Fine Standard (formerly S.A.E. Standard). Coarse thread is American National Coarse Standard (formerly U. S. Standard). Drill size indicated allows for approximately 75% full thread.

FINE THREAD				COARSE THREAD		
BOLT SIZE	Threads per Inch	Drill Size	Tap Size	Threads per Inch	Drill Size	Tap Size
6	40	33	6-40	32	36	6-32
8	36	29	8-36	32	3.40mm	8-32
10	32	21	10-32	24	25	10-24
12	28	4.60mm	12-28	24	4.40mm	12-24
¼"	28	5.50mm	¼"-28	20	7	¼"-20
⅝"	24	I	⅝"-24	18	F	⅝"-18
⅜"	24	8.50mm	⅜"-24	16	⅝"	⅜"-16
⅞"	20	9.90mm	⅞"-20	14	U	⅞"-14
½"	20	11.5mm	½"-20	13	27/64"	½"-13
⅑"	18	13 mm	⅑"-18	12	31/64"	⅑"-12
⅝"	18	14.5mm	⅝"-18	11	*17/32"	⅝"-11
¾"	16	17.5mm	¾"-16	10	16.5mm	¾"-10
⅞"	14	20.5mm	⅞"-14	9	49/64"	⅞"-9
1"	14	*59/64"	1"-14	8	7/8"	1"-8

* Allows for approximately 83% full thread.

To Find Value of Articles Sold by the Ton

Multiply the number of pounds by the price per ton, point off three places and divide by 2

One Month to Same Day in Another

From	to	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
January	365	31	59	90	120	151	181	212	243	273	304	334	
February	334	365	28	59	89	120	150	181	212	242	273	303	
March	306	337	365	31	61	92	122	153	184	214	245	275	
April	275	306	334	365	30	61	91	122	153	183	214	244	
May	245	276	304	335	365	31	61	92	123	153	184	214	
June	214	245	273	304	334	365	30	61	92	123	153	183	
July	184	215	243	274	304	335	365	31	62	92	123	153	
August	153	184	212	243	273	304	334	365	31	61	92	122	
September	122	153	181	212	242	273	303	334	365	30	61	91	
October	92	123	151	182	212	243	273	304	335	365	31	61	
November	61	92	120	151	181	212	242	273	304	334	365	30	
December	31	62	90	121	151	182	212	243	274	304	335	365	

Explanation—To find the number of days from January 20th to December 20th, follow horizontal line opposite January until you reach the column headed by December, when you will find 334, representing the required number of days, and so on with the other months. During leap year, if February enters into the calculation, add one day to result.

To Find Interest on any Sum for any Time

Point off two places from the right of the principal and multiply it by the number of months. One-half the result is the interest at 6 per cent. Deduct one-sixth for 5 per cent, one-third for 4 per cent; add one-sixth for 7 per cent, one-third for 8 per cent, etc.

Time at Which Money Doubles at Interest

Rate Per Cent	Simple Interest	Compound Interest
10	10 years	7 years, 100 days
9	11 years, 40 days	8 years, 16 days
8	12½ years	9 years, 2 days
7	14 years, 104 days	10 years, 89 days
6	16 years, 8 months	11 years, 327 days
5	20 years	15 years, 75 days
4½	22 years, 81 days	15 years, 273 days
4	25 years	17 years, 246 days
3½	28 years, 208 days	20 years, 54 days
3	33 years, 4 months	23 years, 164 days
2½	40 years	28 years, 26 days
2	50 years	35 years, 1 day

Six Per Cent Interest Table

Time		PRINCIPAL									
		\$1	\$2	\$3	\$4	\$5	\$10	\$20	\$50	\$100	\$1000
DAYS	1	\$.00	\$.00	\$.00	\$.00	\$.00	\$.00	\$.01	\$.01	\$.02	\$.17
	2	.00	.00	.00	.00	.00	.00	.01	.02	.03	.34
	3	.00	.00	.00	.00	.00	.01	.01	.03	.05	.50
	4	.00	.00	.00	.00	.00	.01	.01	.03	.07	.67
	5	.00	.00	.00	.00	.00	.01	.02	.04	.08	.83
	6	.00	.00	.00	.00	.01	.01	.02	.05	.10	1.00
	7	.00	.00	.00	.00	.01	.01	.02	.06	.12	1.17
	8	.00	.00	.00	.01	.01	.01	.03	.07	.13	1.33
	9	.00	.00	.00	.01	.01	.02	.03	.08	.15	1.50
	10	.00	.00	.01	.01	.01	.02	.03	.08	.17	1.67
	15	.00	.01	.01	.01	.01	.03	.05	.13	.25	2.50
	20	.00	.01	.01	.01	.02	.03	.07	.17	.33	3.33
	25	.00	.01	.01	.02	.02	.04	.08	.21	.42	4.17
	30	.01	.01	.02	.02	.03	.05	.10	.25	.50	5.00
MONTHS	33	.01	.01	.02	.02	.03	.06	.11	.28	.55	5.50
	63	.01	.02	.03	.04	.05	.11	.21	.53	1.05	10.50
	93	.02	.03	.05	.06	.08	.16	.31	.78	1.55	15.50
	1	.01	.01	.02	.02	.03	.05	.10	.25	.50	5.00
	2	.01	.02	.03	.04	.05	.10	.20	.50	1.00	10.00
	3	.02	.03	.05	.06	.08	.15	.30	.75	1.50	15.00
	4	.02	.04	.06	.08	.10	.20	.40	1.00	2.00	20.00
	5	.03	.05	.08	.10	.13	.25	.50	1.25	2.50	25.00
	6	.03	.06	.09	.12	.15	.30	.60	1.50	3.00	30.00
	7	.04	.07	.11	.14	.18	.35	.70	1.75	3.50	35.00
	8	.04	.08	.12	.16	.20	.40	.80	2.00	4.00	40.00
	9	.05	.09	.14	.18	.23	.45	.90	2.25	4.50	45.00
	10	.05	.10	.15	.20	.25	.50	1.00	2.50	5.00	50.00
	11	.06	.11	.17	.22	.28	.55	1.10	2.75	5.50	55.00
12	.06	.12	.18	.24	.30	.60	1.20	3.00	6.00	60.00	

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A FRIEND WORTH KEEPING

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